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YELLOWSTONE RIVER COMPACT COMMISSION

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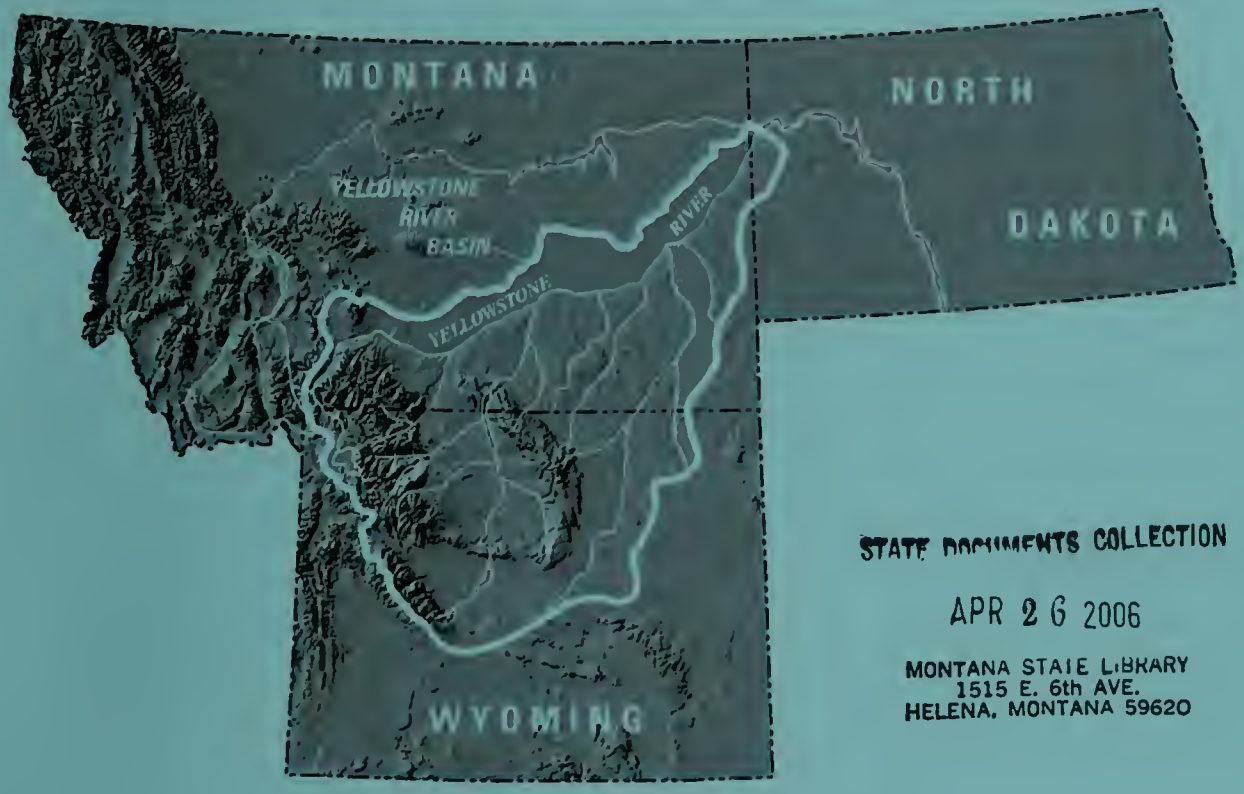

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COMPACT COMMISSION

FIFTY-FOURTH ANNUAL REPORT

2005

YELLOWSTONE RIVER COMPACT COMMISSION
DENVER FEDERAL CENTER, BUILDING 53, ROOM F-1200
LAKEWOOD, COLORADO 80225

Honorable David Freudenthal
Governor of the State of Wyoming
Cheyenne, Wyoming 82002

Honorable Brian Schweitzer
Governor of the State of Montana
Helena, Montana 59620

Honorable John Hoeven
Governor of the State of North Dakota
Bismarck, North Dakota 58501

Dear Governors:

Pursuant to Article III of the Yellowstone River Compact, the Commission submits the following fifty-fourth annual report of activities for the period ending September 30, 2005.

Members of the Yellowstone River Compact Commission convened the first of two meetings in 2005 on April 26 at 8:00 a.m. in Sheridan, Wyoming. In attendance were Mr. William Horak, U.S. Geological Survey (USGS), Chairman and Federal Representative; Mr. Jack Stults, Administrator, Water Resources Division, Montana Department of Natural Resources and Conservation (DNRC) and Commissioner for Montana; and Mr. Patrick Tyrrell, Wyoming State Engineer and Commissioner for Wyoming. Also in attendance were Ms. Sue Lowry, Mr. Mike Whitaker, Ms. Jodee Pring, and Mr. Loren Smith, Wyoming State Engineer's Office; Mr. Hugh McFadden, Wyoming Attorney General's Office; Mr. Keith Kerbel, Mr. Kevin Smith, and Mr. James Robinson, Montana Department of Natural Resources and Conservation (NRCS); Ms. Sarah Bond, Montana Department of Justice; Mr. Chris Levine, Montana Department of Environmental Quality (DEQ); Mr. Art Hayes, Jr., Tongue River Water Users Association; Mr. Roger Muggli and Mr. Ray Muggli, Tongue and Yellowstone River Irrigation District; Mr. Jason Whiteman and Mr. Allen Clubfoot, Water Resources Department, Northern Cheyenne Tribe; Ms. Jill Morrison, Powder River Basin Resource Council; and Mr. Wayne Berkas, U.S. Geological Survey (USGS).

Mr. Horak called the meeting to order. All attendees introduced themselves.

Mr. Berkas reported that the 2004 Yellowstone River Compact Commission report is ready to be published and is waiting for the print contract to be let. Both Commissioners requested that they be allowed to review the report again before it is published. Mr. Berkas said the final report would be e-mailed to them.

Mr. Berkas reported that costs for the program of streamflow-data collection and preparation of the annual report are $71,900 for Federal fiscal year 2005 and are expected to be $76,000 or less for fiscal year 2006.

Mr. Berkas reported on streamflows from six selected USGS stations in the Tongue and Powder River basins.

Tongue River near Dayton—October 2004 through March 2005 streamflows were less than average and returned to average in April.

Tongue River at State Line, near Decker—2004 water-year streamflows were the second lowest in 44 years, current water-year streamflows were less than average, and March 2005 flows were the second lowest March flows in 45 years.

Tongue River at Tongue River Dam, near Decker—2004 water-year streamflows were the third lowest in 65 years, current water-year streamflows were less than average, and the March 2005 flows were the fourth lowest March flows in 66 years.

Tongue River at Miles City—2004 water-year streamflows were the third lowest in 61 years, current water-year streamflows were less than average, and the March 2005 flows were the third lowest March flows in 63 years.

Powder River at Moorhead—2004 water-year streamflows were the second lowest in 73 years, current water-year streamflows were near average from October 2004 through February 2005, and the March 2005 flows were the third lowest March flows in 74 years.

Powder River near Locate—2004 water-year streamflows were the lowest in 66 years, current water year streamflows were near average from November 2004 through February 2005, and the March 2005 flows were the third lowest March flows in 67 years.

Mr. Berkas also reported that a new streamflow and water-quality monitoring station has been established by the USGS on the Tongue River above T and Y Diversion Dam, near Miles City in cooperation with the Tongue and Yellowstone River Irrigation District. The type of data and frequency of sampling at this site is identical to that collected in the Tongue River Surface-Water-Quality Monitoring Network.

Mr. Levine reported on coal-bed methane regulation and development in Montana. Currently, Montana has two discharge permits for the Tongue River. Fidelity Exploration and Production Company has a permit to discharge 1,600 gallons of untreated water into the Tongue River near Decker. They have been discharging at less than their maximum permitted allowable. The second permit is for Powder River Gas to discharge treated water into the Tongue River below the Tongue River Dam. The discharge water must meet the Montana water-quality standards.

Two permits will soon be up for public comment. The Fidelity permit (renewal) will be modified to flow-based permitting. The permit is tied to monthly 7Q10 flows to ensure that water-quality standards in the river are not exceeded during low-flow periods. Another permit for Fidelity is for a treated water discharge. The discharge would have to meet water-quality standards but the permit is not a low-flow based permit.

Mr. Levine expects future permit applications in the Tongue River and Hanging Woman Creek basins.

Mr. Whiteman reported on tribal activities of the Northern Cheyenne Tribe. Congress recently granted a water-rights compact. In Section E of the compact, the Northern Cheyenne Tribe shall adopt appropriate regulations to ensure that the use of tribal water rights is not wasteful and does not degrade the quality of the water. The compact instructs the Tribe to adopt water-quality standards for the Tribe, particularly for surface water. The Tribe feels they have met that requirement in the compact for surface water and ground water.

Mr. Whiteman stated that the Northern Cheyenne Tribe has published in the Code of Federal Regulations and newsletter about revisions to their surface-water quality standard. They are waiting for comments, and comments are due around May 5, 2005.

The Northern Cheyenne Tribe has a right to some of the water stored in the Tongue River Reservoir, and they lease some or all of that water to other users. According to the water-rights compact, the Tribe feels that activities in the Tongue River basin should not be allowed to degrade the water quality in the reservoir compared to 1992. They are concerned that activities in the basin could degrade the water quality of their water right such that the water becomes unleaseable and unusable.

Mr. Tyrell reported that Wyoming has permitted in excess of 20,000 coal-bed methane wells. The Wyoming State Engineer's Office continues to receive applications for permits.

Wyoming has received a total of about 3,900 applications for reservoirs related to coal-bed methane. This includes on-channel reservoirs, off-channel reservoirs, and those applications that were ultimately rejected. About 2,570 have been for new reservoirs (mostly off-channel) and are in areas of surface-water discharge limitations. The on-channel reservoirs typically occur where there are existing stock ponds without permits. In the past, some ranchers

did not acquire permits for small stock ponds, but the State Engineer's Office is attempting to locate these facilities and get them permitted. Examples of the number of reservoir applications and permits by basin are:

Basin	Permits issued	Applications pending
Clear Creek	16	49
Crazy Woman Creek	25	21
Dry Fork Powder River	171	88
Little Powder River (no tributaries)	5	18
Prairie Creek	48	135
Wild Horse Creek	217	204

The size of these reservoirs varies but, generally, most applications are for reservoirs of capacity that fall within the stock-reservoir criteria, which is less than 20 acre-feet.

A year ago, Wyoming hired contractors to inspect dams, including coal-bed methane (CBM) reservoirs. They discovered some reservoirs that did not have permits. The owners of the unpermitted reservoirs were contacted and the owners are applying for permits or are removing the reservoirs. Through time, Wyoming hopes to have permits on all reservoirs.

The reservoir inspectors also ensure that the reservoirs are constructed in accordance with the permit limitations. In basins with downstream water rights, bypass structures may be required and the inspectors check for the bypass features.

Some reservoir permits also contain breach language. If the landowner is the applicant and wants to keep the reservoir at the conclusion of the CBM production, the reservoir needs to be modified to contain 20 acre-feet or less (the maximum permitted size for stock ponds). If the applicant is the energy producer, Wyoming has started issuing CBM reservoir permits with time limits of 15 years or when water production ceases (whichever is earlier). Thus, if there is evidence that the permitted reservoir is not receiving CBM water, the permit can be canceled.

In the last legislative session, Wyoming toughened penalties for constructing reservoirs without a permit. There is a 45-day grace period to allow the owner to apply for a permit. Fines can be as much as $1,250 per day. There was concern with historic stock ponds that do not have permits. The State Engineer's Office will work with the landowner to get the stock pond permitted and not assess a fine.

The Wyoming State Engineer's Office also received supplemental funding to address the application backlog. Through additional staff, overtime hours, and redirecting workload, Wyoming has reduced the number of permit backlogs.

Mr. Levine stated that he noticed that there are some on-stream reservoirs that are designed to hold a 25-year, 24-hour rain event. If this is the case, how would these reservoirs be less than 10 acre-feet? Also, storing runoff water may affect downstream water rights.

Mr. Tyrell replied that in some cases there are bypasses around the reservoirs such that any natural flow that comes down the basin can physically get routed around the reservoir. In other cases the total storm is contained by the reservoir and not bypassed for water rights. The requirements are in the permits. Many reservoirs are in the headwaters of the drainage and have a small drainage area above the reservoir, and thus do not require a large reservoir. The smaller tributaries may not have water rights existing downstream, or the downstream water-right

holder may give consent for the facility. Some of the larger tributaries have existing water rights and reservoirs on those tributaries are identified in the permit.

On-stream structures are required to have a bypass if building the reservoir to the 25-year event means that water will rarely flow over the spillway. To get event flow around a structure for the benefit of downstream water rights, a bypass can be required. Most energy companies try to build the reservoir in a location where a bypass can be avoided because bypasses can be expensive.

Mr. Stults asked if the dam inspectors are determining if there is a permit and if the owner has the required structure.

Mr. Whitaker replied that the dam inspectors identify all facilities in the drainage that can store water. Then they go back and determine what structures are permitted. The State Engineer's Office then contacts the owners of the structures that are not permitted and try to bring those into compliance. When the inspectors visit the site, they describe the structure. If they have the permitted plans, they check the structure against the plans. They check the size of the structure and the size of the bypass to make sure the permit agrees with the structure. If they do not agree, the owner of the structure has 45 days to get the proper permit.

Mr. Levine asked if the reservoirs are designed to infiltrate or store water. If a stock pond leaks, it would not be useful.

Mr. Tyrell replied that they do not have any special requirements in the permit of a stock pond. Essentially, the requirement is to put a pipe in your dike. Nothing addresses whether the pond fills or infiltrates.

Mr. Whitaker replied that off-channel CBM reservoirs are designed to not infiltrate (contain all the water). Some of the recently constructed reservoirs are designed to infiltrate. Allowing water in CBM ponds to infiltrate is provided for under Wyoming DEQ permits.

Mr. Stults commented that the Montana Oil and Gas Commission processes permits for off-channel CBM ponds. On-channel reservoirs are permitted through the Montana DNRC and those reservoirs would need a bypass or other release structure.

Mr. Tyrell continued with his CBM discussion stating that, currently, producers do not have to notify the State when they discontinue producing water to a pond. The inspectors will notice that ponds have not received water for some period and the State will ask the reservoir owner to shut down the reservoir (breach).

From a water-rights perspective, breaching a reservoir means not storing. This could be as simple as a cut through the dam. If the land owner has a reclamation agreement with the operator, the operator may have to remove the dam from the site. Currently, the State of Wyoming has the ability to require reclamation bonding on off-channel structures and the State is discussing pursuing reclamation bonding on on-channel structures. The State wants to make sure all facilities are covered by bonding, so bonding is required on State and Federal land, as well as private land.

Mr. Roger Muggli expressed concern with the permitting process. The current Montana water-quality standard for sodium adsorption ratio (SAR) is 3. Past data for the Tongue River at State line indicates the SAR value was 1.5 before CBM development. It now appears that the SAR in the Tongue River is going to 2.5. Permitting a reservoir does not keep that reservoir from leaking or being overtopped, increasing the SAR in the Tongue River. What will happen to the permitting process if the SAR in the Tongue River reaches 3?

Mr. Tyrell replied that he appreciates Mr. Muggli's comments. The Wyoming State Engineer's Office does not negotiate, permit, or look at the permits relative to the assimilative capacity in Wyoming. They are charged with water rights. Wyoming DEQ is concerned with the SAR assimilative capacity of the Tongue River.

Mr. Muggli commented that a gentleman who works for the U.S. Department of Agriculture (USDA) in eastern Montana said that statistics show that over 90 percent of stock ponds fail (overtop, washout, or pipe) over time. He

stated that he hopes a failure rate is considered as part of the permitting process. Old CBM ponds could have a large amount of sodium due to evaporation that could get into the river if the reservoir fails.

Mr. Horak pointed out that although this has been an excellent discussion, the Yellowstone River Compact Commission has no jurisdiction over water-quality issues. He then suggested that we move on to an update of the USGS Tongue River Monitoring.

Mr. Berkas updated the Committee on the progress of monitoring in the Tongue River Basin. The USGS receives funding appropriated by Congress to monitor the quality of water in the Tongue River. For fiscal year 2005, the USGS received about $140,000 less in funding than originally requested. As a result, the USGS coordinated with other Federal, State, and Tribal agencies to gain their support for part of the monitoring effort as in 2004. Even with the support of other Federal, State, and Tribal agencies, there was not enough to fully fund the proposed monitoring. Thus, some sampling reductions occurred to stay within the budget. The three changes that occurred were:

1. Sampling at Tongue River at Monarch (a mainstem site) was reduced to the same as a tributary site.

2. Sampling at mainstem sites was reduced from 20 samples per year to 18 samples per year.

3. Sampling at tributary sites was reduced from 12 samples per year to 6 samples per year.

Mr. Stults asked how long will the USGS be monitoring the Tongue River basin and when will the USGS be releasing official results?

Mr. Berkas replied that the level of monitoring is commensurate with the level of funding received each year. Thus, if the appropriated funding is decreased, the level of monitoring will decrease, or end. The USGS is receiving funding to monitor the quality of water in the Tongue River basin and the information from the monitoring is displayed on their public Web page on a near real-time basis.

Mr. Stults asked if there was a ground-water component to the monitoring. Mr. Berkas replied that there was no ground-water component.

Ms. Lowry provided a summary of the April 25, 2005, meeting of the Technical Committee (minutes appended). The Committee noted that the snow pack for 2005 is less than average and slightly better than 2004. Flow conditions similar to 2004 are expected if we receive normal precipitation for the remainder of 2005.

Mr. Stults brought up the topic of Compact Administration. The two State Commissioners (Mr. Stults and Mr. Tyrell) discussed Prior Appropriations Doctrine and how it relates to the Yellowstone River Compact, and equitable dispersion of pre-1950 rights in both States. Montana feels that because Prior Appropriation Doctrine exists throughout western water-right law, it applies to the Yellowstone River Compact, and Prior Appropriation should occur across the State line. Wyoming feels that pre-Compact water rights were discussed, but ultimately the Compact was written to only restrict or administer post-1950 water rights, as evidenced by notes of the debates leading up to the composing and signing of the Yellowstone River Compact. Wyoming is party to six other interstate compacts with other States on other river basins. These other compacts are specific in stating when administration without regard for stateline was intended. Both commissioners agreed that both States' technical group should stay in contact and stay in dialogue. Montana feels that the two States should come to a mutual understanding about specific terms in the compact.

Mr. Stults reported that Governor Schweitzer (Montana) recently signed House Bill 22 that will greatly accelerate the adjudication process in Montana. The plans are to complete the examination within 10 years and for the courts to have an additional 5 years to resolve the claims. The whole adjudication process will be completed within 15 years. The process will be funded by billing everyone with a water-right $10 for 10 years.

Mr. Kerbel explained that the Powder River has been fully adjudicated after the 1980's. Good progress has been made on the Yellowstone River to Miles City. A large amount of work remains on Rosebud Creek and the Montana DNRC has just started the lower Tongue River. There are more than 4,600 claims on lower Tongue River. The

Montana DNRC is discovering that for many filings, the property has changed hands since the original filings and the people with the history of water use on the property are not there.

Mr. Kerbel reported that the Montana Legislature passed House Bill 745 that sets aside a 15-million dollar trust fund for the Crow Compact. The Crow Tribe is working on a settlement with the Federal government (Crow vs. Norton). When that is settled, the Tribal Chairman will proceed with the Compact in Congress. Once that is settled, the process will go to State and local governments.

Mr. Horak reported that at the last Compact Commission meeting, it was suggested that the USGS host a Web site that would display Yellowstone River Compact information. The USGS could do this task for the States. Ms. Lowry provided mock ups of Web pages. The commissioners agreed to pursue the Web site.

Mr. Stults reported that the National Drought Preparedness Act has been introduced into Congress (House Bill 1586 and Senate Bill 802). The goal of the act is to recognize drought as a natural disaster. The Stafford Act of the 1970's does not recognize drought as a natural disaster. The most important thing that the National Drought Preparedness Act does is establish a federal policy for drought at the federal level and a policy to prepare for drought. The act would require Federal agencies to come up with a plan for dealing with drought within 18 months of passage of the bill. Currently, Federal programs are mostly reactionary. This act would have Federal agencies focus on preparation and would provide consistency between agencies. The act would provide a National Drought Council that will be located in the U.S. Department of Agriculture, Natural Resources and Environment Section. The act would be funded at 2 million dollars a year, and authorizes (but does not appropriate) money to a National Drought Fund.

The act also authorizes the National Integrated Drought Information System (NIDIS). The NIDIS would integrate all current drought information (from the National Weather Service, USGS, NRCS, climate centers, and others) and make the data available to the public and those who make decisions regarding drought. There is a lot of emerging technologies that could be used to sense and monitor energy and water consumption that could be integrated into NIDIS. Hopefully, people will look at the information, and they may change their consumption habits. More information on this topic can be found on the Western Governors Association Web site (www.westgov.org).

Mr. Tyrell presented a draft resolution to present a note of appreciation to Mr. Kircher, the past Chairman and Federal Representative of the Yellowstone River Compact Commission. The resolution was approved. The document will be signed by the Commisioners, framed, and presented to Mr. Kircher.

The date of the next Yellowstone River Compact Commission meeting is scheduled for November 29 and 30, 2005 (Tuesday and Wednesday).

Members of the Yellowstone River Compact Commission convened the second of two meetings in 2005 on November 30 at 9:00 a.m. in Billings, Montana. In attendance were Mr. William Horak, U.S. Geological Survey (USGS), Chairman and Federal Representative; Mr. Jack Stults, Administrator, Water Resources Division, Montana Department of Natural Resources and Conservation (DNRC) and Commissioner for Montana; Mr. Patrick Tyrrell, Wyoming State Engineer and Commissioner for Wyoming. Also in attendance were Ms. Sue Lowry, Ms. Jodee Pring, Mr. Loren Smith, and Mr. Hugh McFadden, Wyoming State Engineer's Office; Mr. Bill Bensel, Wyoming Water Development Commissioner; Ms. Sarah Bond, Montana Department of Justice; Mr. Chris Levine, Montana Department of Environmental Quality (DEQ); Mr. Art Hayes, Jr., Tongue River Water Users Association; Mr. Douglas Davis, Bureau of Indian Affairs; Mr. Jason Whiteman, Northern Cheyenne Tribe; Mr. Rick Moore, Northern Plains Resource Council; and Mr. Wayne Berkas, USGS; Mr. John Corra, Mr. John Wagner and Mr. Todd Parfitt, Wyoming Department of Environmental Quality (DEQ), and Mr. Kirk Miller, USGS, participated via telephone conference call.

Mr. Horak called the meeting to order and presented a revised agenda for the meeting. Mr. Tyrrell requested that agendas and updates be sent to the Commissioners 1 week prior to the meeting in order that both sides will be prepared to address new items on the agenda. The Commissioners agreed to continue this discussion under the "Potpourri" section of the meeting.

All attendees introduced themselves.

The minutes of the April 2005 meeting were presented for approval. Mr. Tyrrell suggested Montana and Wyoming be given a chance for a final review of the minutes and moved for a continuance of approval of the minutes to the April 2006 meeting. Mr. Horak advised that the annual report is to be filed by December 31, 2005, and the minutes are required to be incorporated in the report. As a practical matter, however, the report usually is filed the first quarter of the new year. After discussion, it was decided the record should show that final review of the minutes for incorporation into the annual report will be completed by the end of January 2006 along with the minutes of this meeting.

Mr. Berkas presented budget information for the program of streamflow data collection and preparation of the annual report. The program cost was $71,900 for Federal fiscal year 2005 and will be $76,000 for fiscal year 2006. One-fourth of the cost is provided by the State of Wyoming, one-fourth by the State of Montana, and one-half by the U.S. Geological Survey through the Cooperative Water Program. Estimates for costs for future years are based on an approximate 5-percent inflation factor per year.

Mr. Berkas reported that streamflows during water year 2005 were within normal on the Clarks Fork Yellowstone River at Edgar (80 percent of average) and the Tongue River at Miles City (82 percent of average), and below normal on the Bighorn River near Bighorn (adjusted for the flow of the Little Bighorn River and change in contents in Bighorn Lake, 74 percent of average) and the Powder River near Locate (70 percent of average). Total adjusted streamflow in the four rivers in water year 2005 was 2,950,000 acre-feet, compared to 1,621,000 acre-feet in water year 2004 and 2,174,000 acre feet in water year 2003.

Reservoir storage increased during water year 2005 in Bighorn Lake, Boysen Reservoir, Buffalo Bill Reservoir, and Tongue River Reservoir. Reservoir storage decreased in Anchor Reservoir, Bull Lake, and Pilot Butte Reservoir. The contents and amounts of increases and decreases are listed in the report. The total usable contents of these reservoirs at the end of water year 2005 was 2,149,100 acre feet, which is an increase of 409,500 acre feet from the end of water year 2004. Additional reservoir storage at the end of 2005 was 287,726 acre-feet, an increase of 72,385 acre-feet from the end of water year 2004. The total usable contents of these reservoirs are listed in the annual report.

Mr. Miller reported streamflow in water year 2005 was 75 percent of average on the Bighorn River near Kane, Wyo., and was 86 percent of average on the Tongue River near Dayton, Wyo.

Mr. Berkas advised the Commissioners that, historically, figures 1 through 4 in the annual report show a bar in the bar chart for 1931 through 1940 for each of the four rivers. Some sites do not have data for the complete 1931 through 1940 period. The period of record for the Clarks Fork Yellowstone River near Edgar is from 1921 to present, the Bighorn River near Bighorn is 1945 to present, the Tongue River at Miles City is 1938 to 1942 and 1946 to present, and the Powder River near Locate is 1938 to present. Mr. Berkas advised that figures 1 through 4 be revised to better reflect the available data at the four streamflow sites.

After discussion, Mr. Horak advised that the Yellowstone River Compact Technical Committee address this problem during the April 2006 meeting and then make recommendations to the Yellowstone River Compact Commission.

Mr. Stults reported that drought planning in Montana has not significantly changed. The detailed management of water allocation is basin-by-basin and by water users within each basin. The State is encouraging management plans that provide a mechanism for shepherding the water supply in a way that maximizes use. Statewide drought planning is done through the Governor's Drought Advisory Committee, and they focus on local response, creating county-based drought planning committees that work with water users at a local level.

Mr. Tyrrell reported that Wyoming's drought planning is encompassed in Wyoming's water planning program. Wyoming is in the process of doing a statewide framework plan that includes some planning for dry periods. Once the framework is done, the basins will be revisited on a 5-year rotating schedule to update data on population, industry, and agriculture.

Mr. Tyrrell announced that Jan Curtis, the State Climatologist, resigned. The State Climatologist disseminated most of Wyoming's drought information.

Ms. Lowry reported that Wyoming has a Drought Task Force, but due to close to normal precipitation in 2005 the group has been less active. The task force obtained information that will be useful in the future.

Mr. Levine asked the State representatives, "When is a drought over?" Mr. Stults replied that from his perspective many of the programs that attempt to mitigate drought or respond to drought are based on false triggers. Typically in Federal programs, three months of average or above average precipitation signify the end of the drought, and it does not matter if you have been in a deficit for 7 or 8 years. Through the work of climatologists, analyses clearly show there are various means of defining drought, such as hydrologic drought and the economic effects of drought. Montana feels it will take 3 years of above-average precipitation (125 percent of normal) to get Montana back to a balanced status.

Ms. Lowry advised the Commission that the Technical Committee needs some direction for their task concerning reporting on years of drought. If the Commission wants the Technical Committee to forecast and estimate the number of water rights that could be filled, that task would require State-to-State discussions and more commitment and time from each State to better understand each State's administrative system.

Mr. Stults stated that task would be great to do, but it is not feasible at this time because of the constraint on resources. Montana hopes that science and analysis can provide some ways in which Montana can better optimize the total use of the supply to the advantage of everybody.

Mr. Wagner gave a brief history of coal-bed methane development in northeastern Wyoming. Coal-bed methane development started in 1997, basically in the eastern part of the Powder River Basin, with most of the water discharging into the Belle Fourche and Cheyenne River drainages. As time went on, development moved toward the west and the north. More and more water is discharging into the Little Powder, the Powder, and the Tongue River drainages. In 1997, there were 95 coal-bed methane outfalls, and the total amount of water being produced was approximately 8 cubic feet per second (ft^3/s). In 2005, coal-bed methane outfalls increased to approximately 5,800 and the total amount of water produced was approximately 58 ft^3/s. From 1997 to 2005, the number of staff dedicated to managing CBM development has increased from 7 to 27 people. The discharge permits issued to release water into the Powder, the Little Powder, and the Tongue River drainages are available for review from the Wyoming DEQ.

Currently, there are 46 active discharge permits on the Tongue River, 108 active permits on the Little Powder River, and 343 active permits on the Powder River drainages. Wyoming DEQ has initiated a watershed-based permitting approach in the Powder River Basin, and they will initiate a watershed permitting process in the Tongue River basin in the near future.

Mr. Tyrrell asked if the 58 ft^3/s reported was the total of all discharges. Mr. Wagner replied that 58 ft^3/s is the amount of water being produced, as reported by the Wyoming Oil and Gas Conservation Commission. It does not mean that all the water is going down the drainages. A lot of the water is captured in retention ponds of various types, either off channel or on channel. A small percentage is being reinjected into aquifers. Thus, the 58 ft^3/s is the amount of water being produced, not the amount of water discharged down the drainage.

Mr. Horak asked Mr. Parfitt to define "watershed-based permitting process." Mr. Parfitt replied the Wyoming DEQ has divided the basins into HUC-10 size units for developing permits. All the stakeholders come together in a committee and develop permits for each watershed. Once that permit is developed, a general permit would be issued for each HUC-10 unit within the watershed. This process ensures consistent conditions throughout that watershed, and up-front input from the stakeholders within that watershed. Under the general permitting concept, anybody desiring to discharge under the conditions of the general permit would submit a "Notice of Intent" or an application rather than submitting individual permits. Anybody operating within that watershed would be operating under the conditions of that general permit.

Mr. Stults inquired if the general permits have an identified discharge rate for the watershed. Mr. Parfitt said that discharge rates probably will vary from watershed to watershed. The permits they are currently working on will have flow rates that will not exceed the stream channel for the ephemeral drainages and that would minimize erosional impacts. Also, within the Powder River Basin, the Wyoming DEQ will be looking at flows related to the assimilative capacity of the river. In a separate approach, the assimilative capacity of the Powder River will be modeled to protect the Montana water-quality standard.

Mr. Stults asked if the Wyoming DEQ is working with a numerical or a narrative standard. Mr. Parfitt said that they worked with the numerical standard that the State of Montana has developed. Wyoming does not have a numerical standard for either sodium adsorption ratio (SAR) or electrical conductance (EC). They have what is called a narrative standard that requires them to protect the uses of the stream, in particular, irrigation. Thus, they have to consider both when they put together a permit.

Ms. Bond asked if any general permits have been issued for watersheds or if this is a process that is still in development. Mr. Parfitt said that this is a process that is under development, and the first of the watershed permits are receiving public notice. Two of the permits are scheduled to be general permits, and one of the permits will be developed as a plan rather than a general permit. The three watersheds scheduled for public notice are on Pumpkin Creek, Willow Creek, and Four Mile Creek with the Four Mile Creek watershed being a watershed plan rather than a general permit.

Ms. Bond asked if each discharge is individually permitted under the general permit process. Mr. Parfitt responded that was correct. Ms. Bond also asked if the purpose of the watershed general permit system was to speed up the permitting process. Mr. Parfitt responded that it was not necessarily to speed up the permitting as much as it was to be efficient with resources, consistent with the permitting process, and efficient with use of staff resources.

Ms. Bond inquired if the process allows for staff to impose an individual permit if the conditions warrant under a general permit. Mr. Parfitt replied that if somebody applies for a permit and they do not meet the conditions of the general permit because they have some unique characteristic that was not contemplated in the general permit, they would have to apply for an individual permit. The unique characteristics in the individual permit would be addressed, but the individual permit would carry with it similar conditions as appropriate in the general permit.

Ms. Bond asked if there was a maximum flow rate for discharges in the Pumpkin, Willow, and Four Mile Creek watersheds. Mr. Parfitt replied that currently the only restrictions with flow pertain to protection for erosion within the channels and maintaining flow within the ephemeral channels. Channel capacity studies have been done. The other factor that will come into play will be the assimilative capacity approach.

Ms. Bond asked how current work being done by Wyoming DEQ dovetails with pond permitting. Mr. Tyrrell responded that the Wyoming DEQ and Wyoming State Engineer's office know which applications are in each other's office. Dovetailing can occur when discharges are limited or not allowed. Sometimes they get applications for storing and not releasing CBM water. In those cases, they have taken a permitting approach as water needs to be shepherded past those reservoirs.

Ms. Bond asked if she could receive the number of outfalls by basin. Mr. Parfitt said there are 402 active outfalls in the Tongue River basin, associated with 46 active permits; 654 active outfalls in the Little Powder basin, associated with 108 active permits; and 2,619 active outfalls in the Powder River basin, associated with 343 active permits. The remaining outfalls are in the Belle Fourche River and the Cheyenne River basins.

Ms. Bond asked how many of the permittees were doing injection, and how many are doing deep reinjection. Mr. Wagner replied that more than 300 wells are permitted for injection; however, it appears that only 50 or so were actually ever used for reinjection and currently only about 20 of those are active. Currently, about 2 percent of the water being produced (58 ft^3/s) is being reinjected.

Mr. Stults asked if injection is an efficient and effective method of disposal. Mr. Wagner replied operators in the Powder River Basin are having difficulty finding aquifers that can take the volumes of water that are produced.

Mr. Tyrrell interjected information pertaining to permits and outfalls. In the Tongue River, Powder River, and Little Powder River drainages, 2,268 reservoir permits (total capacity 27,166 acre-feet) were issued by the State Engineer's Office for coal-bed methane related activities. These permits are on the ground and average about 11.9 acre-feet per structure. Also, there are 709 temporary filings (applications that have not advanced to permit status) for approximately 14,100 acre-feet of storage, an average of 19.9 acre-feet per structure. Some permit applications have been received from the Rawhide Creek drainage on unpermitted reservoirs. Also, the Wyoming State Engineer's office is studying the Wild Horse Creek drainage and other drainages farther up in the basin.

Mr. Levine asked for the number of permits for CBM ponds in-channel and off-channel. Mr. Tyrrell said that he did not have that information. Until recently, discharge permits were not available from the Tongue River and Prairie Dog Creek drainages. There appears to be a lot of off-channel permits in these two drainages compared to the Belle Fourche drainage. Mr. Tyrrell added that Wyoming DEQ has the authority to bond in-channel structures that others (Bureau of Land Management or Wyoming Oil and Gas Commission) have not bonded, and the Wyoming DEQ is getting reclamation bonds in place. There are three permits for ponds to discharge to the Tongue River drainage. One permit has treatment to the Montana standard at the end of the pipe, and water is no longer discharging for this permit. The other two permits were issued early in CBM development, do not require treatment, and contribute a total of 0.4 ft^3/s to the Tongue River.

Mr. Levine asked how EC and SAR allocation processes were going in Wyoming. Mr. Parfitt said the only place where the Wyoming DEQ is using an assimilative capacity approach is on the Powder River.

Mr. Levine reported that the Montana DEQ does not have a delegated staff person for CBM activities. The Bureau of Land Management (BLM) has produced watershed reports in 2004 on water chemistry. Montana Fish, Wildlife and Parks is doing bicarbonate toxicity testing on fish (bicarbonate is the major ion in CBM water). The U.S. Environmental Protection Agency (USEPA) has put together a model for water-quality response and flow response to storage and discharges in the Tongue River basin. Montana DEQ and USEPA will publish a joint report describing the modeling effort and the water-quality assessment. Montana DEQ and USEPA also are trying to put together a sequence of events report for the Powder River Basin water-quality assessment and total-maximum daily load (TMDL) activities and that report will be provided to the public.

Permitting in the Powder River and Rosebud Creek drainages are separate entities and permitting is moving along on their own pace. In the Tongue River drainage, there are two permits for direct discharge to the Tongue River. One of the permits is for untreated water and this permit belongs to Fidelity. This permit is being renewed and should be reissued soon. Upper management of the Montana DEQ has a few policy decisions to make and those decisions will affect the final appearance of these two permits.

There are less than 500 total CBM wells in Montana.

The Northern Plains Resource Council and others have petitioned the Board of Environmental Review (the Montana Board that adopts water-quality standards and standards for treatment) to require reinjection of all CBM water. If that is not possible, because formations can not take the water, then the water has to be treated prior to discharge. That petition process is underway. There have been two public hearings, one in Lame Deer and the other in Miles City. The U.S. Department of Energy is coming out with a report on the economics of reinjection. They also are doing studies on technical feasibility and an environmental impact study. The comment period for the petition has been extended for 2 months. Also, the petition requests modification of the non-degradation policy for EC and SAR.

Mr. Whiteman stated that the Northern Cheyenne Tribe has started a coal-bed methane ground-water-monitoring network on the Northern Cheyenne Reservation. Two years ago, six monitoring wells were installed and two were added this year in the Birney area. The tribe would like to install more wells in some areas. The tribe is concerned about the nature of extraction of the coalbed methane, and their water right.

Mr. Tyrrell discussed the topic of a joint water-use study. Wyoming asked their legislature for an appropriation to their budget to study water use in both States. Wyoming hopes that Montana can participate equally in the study.

An additional objective of the appropriation is to utilize money internally to look at Wyoming's water uses relative to compact allowances within Wyoming.

Mr. Stults agreed that it would be advantageous to do something jointly; however, Montana's biennium is a year away and funds are not currently available. Mr. Stults added he has been talking with the administration and they are interested in trying to do something along this line and optimistic about the opportunity to do some collaborative work with Wyoming.

Mr. Stults reported that Montana has a major infusion of resources to accelerate the state-wide adjudication. An additional 39 people were hired and are working at a rate that is going to meet or exceed the benchmarks that are set by statute. The Montana DNRC will send bills to all water-right holders in December with fees to be paid by the end of January. The Bighorn and Little Bighorn River basins are about 90 to 95 percent completed. The Two Leggins Canal project needs some review before the basins can be transmitted to the Water Court for it to issue decrees. The Tongue River basin is split into two parts, upper and lower. The upper Tongue River basin is about 20 percent complete. The Water Court has not given permission to begin the lower Tongue River basin. The Powder River basin is in final decree.

Mr. Stults reported that there has been little change to the Montana Crow Compact. They are waiting for the compact to move through Federal legislation. The current Federal administration has significantly altered their perspective on what Federal liability is nationwide with respect to "damage claims" of tribes. They are applying an entirely new perspective on the concept of statute of limitations that almost eliminates Federal liability and has delayed progress on the Crow Compact.

Mr. Stults reported that the Tongue River basin and the Bighorn River basin are closed to new appropriations of water because of the compacts with the Northern Cheyenne and Crow Tribes. The Montana DNRC is able to issue certificates for small ground-water developments. Issuing new water rights has slowed down Statewide. Montana sees more conflict and fewer opportunities for new water to be developed because of limits on availability.

Mr. Tyrrell reported Wyoming has a general adjudication on-going in the Bighorn River basin, and they are striving for completion by spring or summer of 2006. Anchor Reservoir will be adjudicated. Some of the larger districts and canals are being completed, such as the Midvale, Riverton Valley, and LeClair Districts (approximately 100,000 acres). New permits are being issued, but there are few, if any, large permits. Agriculture in Wyoming is not growing, so there are not a lot of new significant permits.

Mr. Tyrrell reported on Wyoming Water Development. The Middle Fork of the Powder River reservoir proposal has been withdrawn in favor of a watershed study that is nonspecific to any reservoir site.

Ms. Lowry presented a summary sheet to the Commission for each water-development project being reviewed for potential support and funding. The majority of the projects are for subdivisions and municipalities that either need storage, a well, or pipelines.

Midvale is an irrigation project that consists of more than 70,000 acres. The project consists of a conservation plan to look at efficiencies to better utilize storage. There are tribal projects looking at ground water for the Shoshone and Arapaho Tribes. Essentially, all of the projects are done through a project sponsor who pays $1,000 with the application. The project sponsors must have taxing authority to show some assurance of ability to pay. At the level 1 stage, which is essentially just cursory feasibility, the Commission pays the entire amount, excluding the $1,000 application fee. Once a project looks favorable, it progresses to design (level 2). Level 3 is construction and has to be on a cost-share loan basis.

Ms. Pring said that a mockup for the Yellowstone River Compact Commission Web site was completed. Mr. Horak stated that the USGS committed to serving the Web site at the April 2005 meeting, but he has been looking into organizational constraints, policy issues, and security matters. He felt these issues will be resolved and a Web site will be running on the USGS server by the end of 2005. The Web site will be reviewed by the Commissioners before it is open to the public.

Under Potpourri, discussion concerned distribution of the agenda prior to meetings and distributing the minutes from the meeting.

Mr. Tyrrell moved that the draft agenda be distributed to the Commissioners and principals 30 days prior to the meeting date. Comments are to be returned such that the final agenda can be issued 14 days prior to the meeting. Mr. Stults seconded the motion. Motion carried.

Mr. Stults moved that the general policy will be that the draft minutes will be issued to the Commissioners and their principals 45 days after the meeting. Comments are due back to the secretary 30 days after the draft is sent. The final minutes will be sent to the Commissioners and principals no less than 14 days before the next meeting. Mr. Tyrrell seconded the motion. Motion carried.

Mr. Stults moved to apply the same schedule for the Commission meeting minutes to the Technical Committee meeting minutes. Mr. Tyrrell seconded the motion. Motion carried.

Mr. Horak asked if agenda items needed to be added to or removed from the next meeting agenda. New Water Rights, Ongoing Adjudication, and Wyoming Water Development could be removed from the agenda.

The next Yellowstone River Compact Commission meeting will be held in Thermopolis, Wyo. The Technical Committee will meet on April 12, 2006, and the Compact Commission meeting will be on April 13, 2006.

The meeting was adjourned at 12:55 p.m.

Addendum to the minutes: During his review of the draft version of the minutes of the November 30, 2005, annual meeting, Mr. Jack Stults, the Montana Commissioner, raised questions relating to the informal discussion with the Wyoming Department of Environmental Quality personnel that occurred at the meeting about coal-bed methane (CBM) development in Wyoming. Although Mr. Stults acknowledges that the minutes accurately reflect statements made at the meeting, he has questioned the accuracy of the information. He has requested through Mr. Patrick Tyrrell, the Wyoming Commissioner, that the information on water produced from Wyoming CBM development presented at the meeting be reviewed for accuracy and that some of the CBM-related terminology be clarified. Mr. Tyrrell has agreed to Mr. Stults request. The Commissioners agree that none of the post-meeting discussion about coal-bed methane development was intended to be incorporated into the formal record of business of the November 30 Commission meeting.

Patrick T. Tyrrell
Commissioner for Wyoming

Jack Stults
Commissioner for Montana

William F. Horak, Jr.
Chairman and Federal Representative

Appended minutes: Yellowstone River Compact Commission, Technical Committee Discussions, Sheridan County Courthouse, 2nd Floor, Sheridan, Wyo., April 25, 2005 at 1:30 p.m.

Everyone in attendance introduced themselves (a list of attendees is presented at the end of these appended minutes). There was a recap of Commission meeting December 6, 2004. A technical meeting was not held in December 2004; thus, information about water-supply forecasting was deferred until this meeting.

Updates about hydrological information came from various sources.

Mr. Berkas, U.S. Geological Survey (USGS), handed out hydrographs of the various streamgages in the Tongue and Powder River basins. Water year 2004 was the second lowest in the period of record for Tongue River at State line, at Decker. The Powder River at Locate gage documented the lowest annual streamflow ever recorded for that site.

Mr. Miller (USGS) provided a hydrograph for the Tongue River at Dayton. For water year 2004, annual mean streamflow was the lowest of record. Streamflow for water year 2002 and 2001 are the second and third lowest on record. On the Bighorn side of the mountains, the Kane gage on the mainstem of the Bighorn River also is setting record low flows. The Shoshone River basin also is quite dry this year.

It was requested if additional gages could be reviewed for upcoming years and if a graph of annual flow over the period of record could be displayed.

Mr. Kaiser, U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS), provided verification information for water year 2004 and 2005 forecast data for the Tongue River. Roy discussed the soil moisture model that is incorporated into the forecasts. The NRCS plans call for additional probes to be added at SNOTEL sites in the next couple of years. Runoff in 2005 may be a slight improvement over last year due to slightly improved soil moistures. Forecast amounts continue to decrease as precipitation continues to be below average.

It was noted that Mr. Lee Hackleman has taken the Snow Survey coordinator position in Wyoming, taking Mr. David Taylor's old job.

Mr. Keith Meier, National Oceanic and Atmospheric Administration, National Weather Service (NWS), had several graphs of past precipitation and temperature deviations over the past several months.

Mr. Fahey presented a powerpoint show of the flood forecasting responsibilities of the NWS in the Riverton, Wyo., office.

Reservoir operations and storage information in both states came from various sources:

Ms. Pring and Mr. Whitaker, Wyoming State Engineer's Office, showed information about reservoir operations and storage information that can be located at *http://waterplan.state.wy.us*. The reservoir information is under Task 2.F. on that Web site. The reservoir information from the Powder-Tongue Water Planning document is for the following facilities:

Park Reservoir—Big Goose; Big Horn—Cross Creek; Cloud Peak—South Piney Creek—used in connection with Willow Park; Cross Creek Reservoir; Dome Lake No. 1 Reservoir; Healy Reservoir; Kearney Lake; Lake DeSmet; Muddy Guard No. 2; Sawmill; Tie Hack; Twin Lakes; Willow Park.

Mr. Kevin Smith, Montana Department of Natural Resources and Conservation (DNRC), Tongue River Reservoir Operations, said the DNRC owns several water projects across the State and contracts are written to water users for storage water delivery. Tongue River Reservoir's total capacity is 79,080 acre-feet and 40,000 acre-feet in contracts have been negotiated; 20,000 acre-feet is dedicated to the Northern

Cheyenne Tribe; the remainder is in minimum and dead pool. The delivery period for storage water is May 1 to Sept. 30. Users usually do not call for water until July, but this past year water was needed in May. Decreed water users are specified in the 1914 Tongue River Court Decree. The priority date for the original reservoir is 1938. The enlargement for the Northern Cheyenne Tribe is considered a 1900 water right per the Settlement document. The original capacity of the reservoir was 59,064 acre-feet. The Settlement agreement subordinated the additional storage to existing uses. Full tribal development has not yet occurred, but some lease of that water is made to non-Indians. If the releases out of the Reservoir are below 50 ft^3/s, stock access can be limited. This past year, releases were decreased to 70 ft^3/s to try and increase storage during the winter months. During times of more normal hydrology, the reservoir would be drafted during the winter to make room for flood control. In 2003, the reservoir filled and spilled. Tongue River Water Users operate to have the Reservoir full on July 4th. Tongue River Water Users have broken the river into 6 segments for delivery purposes and assessing conveyance losses. The river commissioners report every 2 weeks to the District court the amount of the decreed rights and the storage rights. The Montana DNRC Web page shows release amounts as well as storage. Montana Fish, Wildlife and Parks have an assigned instream flow (ISF) right with a priority date of 1978. If flows drop below the 90% percentile that the ISF is based upon, then the State is to release inflows. They are not obligated to draft storage to meet the release for ISF.

A report of the meeting highlights and recommendations will go to the Commission meeting on April 26, 2005. Ms. Lowry and Mr. Keith Kerbel recapped the summary to be presented to the full Commission meeting.

The next technical committee meeting was set for November 29, 2005, at 1:00 p.m. and the regular Commission meeting was set for November 30, 2005, at 8:00 a.m.

Mr. Stults commented that we have not gone the next step with taking the water-supply information and trying to relate that to how many water rights will get filled and who will get turned off. We are seeing record low flows in the last 4 to 5 years. When we experience these low flows, the question is whether the small amount of water that is available is being distributed equitably.

Mr. Horak asked if the pre-1950 rights have been mapped and whether we know the locations in both States of all the pre-1950's. Mr. Tyrrell described that very few post-1950 rights are in Wyoming's Tabulated Adjudicated Water Rights. Discussion was held of the small amount of early 1880 rights that are on in these water-tight years.

Submitted by Ms. Sue Lowry, June 6, 2005.

List of attendees:

Name	Representing	Email
Ms. Jodee Pring	Wyoming State Engineer's Office	jpring@seo.wyo.gov
Mr. Mike Whitaker	Wyoming State Engineer's Office	mwhita@seo.wyo.gov
Mr. Loren Smith	Wyoming State Engineer's Office	lsmith@seo.wyo.gov
Mr. Carmine Loguidice	Wyoming State Engineer's Office	clogui@seo.wyo.gov
Mr. Roy Kaiser	NRCS/USDA	roy.kaiser@mt.usda.gov
Mr. James Fahey	NWS/NOAA (Riverton, Wyo.)	james.fahey@noaa.gov
Mr. Joe Sullivan	NWS/NOAA (Riverton, Wyo.)	joe.sullivan@noaa.gov
Mr. Keith Meier	NWS/NOAA (Billings, Mont.)	keith.meier@noaa.gov
Ms. Sarah Bond	State of Montana, Attorney General's Office	sbond@state.mt.us
Mr. Jack Stults	Montana Commissioner	jstults@mt.gov
Mr. Kevin Smith	Montana DNRC	ksmith@mt.gov
Mr. Wayne Berkas	USGS, Montana Water Science Center	wrberkas@usgs.gov
Mr. Christian Levine	Montana DEQ	clevine@mt.gov
Mr. Kirk Miller	USGS, Wyoming Water Science Center	kmiller@usgs.gov
Mr. Patrick Tyrrell	Wyoming Commissioner	ptyrre@seo.wyo.gov
Mr. William Horak	USGS, Chairman and Federal Representative	wfhorak@usgs.gov
Mr. James Robinson	Water Resources Division, Montana DNRC	jrobinson@state.mt.us
Mr. Keith Kerbel	Water Resources Division, Montana DNRC	kkerbel@mt.gov
Mr. Art Hayes, Sr.	Tongue River Water Users	browncattle@rangeweb.net
Ms. Sue Lowry	Wyoming State Engineer's Office	slowry@seo.wyo.gov

CONTENTS

Page

Letter to Governors of signatory States II
General report 1
Cost of operation and budget 1
Streamflow-gaging station operation 1
Diversions 2
Reservoir contents 2
Reservoirs completed after January 1, 1950 2
Reservoirs existing on January 1, 1950 2
Annual contents of reservoirs 2
Summary of discharge for Yellowstone River Compact streamflow-gaging stations 3
Clarks Fork Yellowstone River at Edgar, Mont. 3
Little Bighorn River near Hardin, Mont. 6
Bighorn River above Tullock Creek, near Bighorn, Mont. 8
Tongue River at Miles City, Mont. 11
Powder River near Locate, Mont. 14
Month-end contents for Yellowstone River Compact reservoirs completed after January 1, 1950 17
Boysen Reservoir, Wyo. 17
Anchor Reservoir, Wyo. 18
Bighorn Lake near St. Xavier, Mont. 19
Month-end contents for Yellowstone River Compact reservoirs existing on January 1, 1950 20
Water-year-end contents for Yellowstone River Compact reservoirs or lakes 21
Rules and regulations for administration of the Yellowstone River Compact 22
Rules for the resolution of disputes over the administration of the Yellowstone River Compact 26
Rules for adjudicating water rights on interstate ditches 29
Claim form for interstate ditches 34
Conversion table 38

ILLUSTRATIONS

Map showing locations of Yellowstone River Compact streamflow-gaging and reservoir-content stations ..... in back

Figures 1-4. Graphs showing comparison of discharge during water year 2005 with discharge during water year 2004 and with 10-year and 30-year average discharges for:

1. Clarks Fork Yellowstone River at Edgar, Mont. 5
2. Bighorn River above Tullock Creek, near Bighorn, Mont. 10
3. Tongue River at Miles City, Mont. 13
4. Powder River near Locate, Mont. 16

GENERAL REPORT

Cost of operation and budget

The work funded by the Yellowstone River Compact Commission, which to date has been primarily concerned with the collection of required hydrologic data, has been financed through cooperative arrangements whereby Montana and Wyoming each bear one-fourth of the cost, and the remaining one-half is borne by the United States. The salaries and necessary expenses of the State and U.S. Geological Survey representatives to the Commission and the cost to other agencies of collecting hydrologic data are not considered as expenses of the Commission.

The expense of the Commission during fiscal year 2005 was $71,900, in accordance with the budget adopted for the year.

The estimated budgets for Federal fiscal years 2006, 2007, 2008, and 2009, based on an approximate 5-percent increase per year, were tentatively adopted subject to the availability of appropriations. The budgets for the four fiscal years are summarized as follows:

October 1, 2005, to September 30, 2006 (fiscal year 2006):	
Estimate for continuation of existing streamflow-gaging programs	$76,000
October 1, 2006, to September 30, 2007 (fiscal year 2007):	
Estimate for continuation of existing streamflow-gaging programs	$80,000
October 1, 2007, to September 30, 2008 (fiscal year 2008):	
Estimate for continuation of existing streamflow-gaging programs	$84,000
October 1, 2008, to September 30, 2009 (fiscal year 2009):	
Estimate for continuation of existing streamflow-gaging programs	$88,000

Streamflow-gaging station operation

Operation of streamflow-gaging stations at the measuring sites specified in the Yellowstone River Compact continued in water year 2005 and satisfactory records were collected at each station. Locations of streamflow-gaging stations, along with reservoir-content stations, are shown on a map of the Yellowstone River Basin at the end of this report.

For measurement sites, horizontal coordinate information (latitude and longitude) is referenced to the North American Datum of 1927 (NAD 27). The gage datums and elevations listed in this report are referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).

During water year 2005, annual streamflow was below normal[1] at the Bighorn River and Powder River and normal at the Clarks Fork Yellowstone River and Tongue River gaging stations.

Station number	Streamflow-gaging station	Percent of average streamflow[2]
06208500	Clarks Fork Yellowstone River at Edgar, Mont., minus diversions to White Horse Canal	80
06294500	Bighorn River above Tullock Creek, near Bighorn, Mont., minus Little Bighorn River near Hardin, Mont., adjusted for change in contents in Bighorn Lake	74
06308500	Tongue River at Miles City, Mont.	82
06326500	Powder River near Locate, Mont.	70

[1]The "normal" range defined in this report is 80 to 120 percent of average.
[2]Average is based on period of record at station.

Tabulation of water-discharge records for water year 2005 and graphical comparisons of discharge during water year 2005 with discharge during water year 2004 and with 10-year (1931-40) and 30-year (1971-2000) average discharges are provided in the section "Summary of discharge for Yellowstone River Compact streamflow-gaging stations."

Diversions

No diversions were regulated by the Commission during water year 2005.

Reservoir contents

Reservoirs completed after January 1, 1950

Boysen Reservoir, located on the Wind River and operated by the Bureau of Reclamation, began the water year with 475,100 acre-feet in storage and ended the water year with 591,900 acre-feet. Anchor Reservoir began the water year with 429 acre-feet in storage and ended the water year with 269 acre-feet. Bighorn Lake, a Bureau of Reclamation storage project on the Bighorn River that is the largest in the basin, contained 694,300 acre-feet at the beginning of the water year and 984,500 acre-feet at the end of the water year. Daily contents of Bighorn Lake ranged from 641,900 acre-feet on April 8, 2005 to 1,091,000 acre-feet on July 1, 2005. Month-end and year-end contents and a description of these reservoirs are given in the section "Month-end contents for Yellowstone River Compact reservoirs completed after January 1, 1950."

Reservoirs existing on January 1, 1950

As a matter of record and general information, month-end contents data are given later in the report for four reservoirs in existence upstream from the points of measurement on January 1, 1950. The reservoirs are Bull Lake, Pilot Butte Reservoir, Buffalo Bill Reservoir, and Tongue River Reservoir. These data are pertinent to allocation under Article V, Section C, Item 3 of the Compact. Month-end and year-end contents of these reservoirs are given in the section "Month-end contents for Yellowstone River Compact reservoirs existing on January 1, 1950."

The storage capacity of Buffalo Bill Reservoir was increased in 1992 from 456,600 acre-feet to 644,540 acre-feet (listed as 646,565 acre-feet by Bureau of Reclamation). The storage capacity of Tongue River Reservoir was increased in 1999 from 68,000 acre-feet to 79,070 acre-feet.

Annual contents of reservoirs

Information on reservoir contents at the end of the current and previous water years for the 7 reservoirs listed above plus 23 additional reservoirs was compiled at the request of the Commission. The information is provided in the section "Water-year-end contents for Yellowstone River Compact reservoirs or lakes."

SUMMARY OF DISCHARGE FOR YELLOWSTONE RIVER COMPACT STREAMFLOW-GAGING STATIONS

06208500 Clarks Fork Yellowstone River at Edgar, Mont.

LOCATION.--Lat 45°27'58", long 108°50'35" (NAD 27), in SE¼SE¼SE¼ sec.23, T.4 S., R.23 E., Carbon County, Hydrologic Unit 10070006, on right bank 400 ft downstream from county bridge, 0.5 mi east of Edgar, 6 mi upstream from Rock Creek, and at river mile 22.1.

DRAINAGE AREA.--2,022 mi^2.

PERIOD OF RECORD.--July 1921 to September 1969, October 1986 to current year.

REVISED RECORDS.--WSP 1509: 1924, 1932(M). WSP 1729: Drainage area. WDR MT-04-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,460 ft (NGVD 29). Prior to Aug. 31, 1953, nonrecording gage at same site and elevation.

REMARKS.--Records good except those for the estimated daily discharges, which are poor. Diversions for irrigation of about 41,500 acres, of which about 840 acres lie downstream from the station. In addition, about 6,300 acres of land upstream from the station are irrigated by diversions from the adjoining Rock Creek basin. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year. **Discharge values given herein have the diversions to White Horse Canal subtracted.**

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	704	671	e410	e340	e390	308	273	572	1,900	2,470	224	152
2	736	648	e390	e320	e400	310	261	539	1,800	2,420	221	151
3	698	578	e400	e330	e410	309	263	520	1,720	2,460	233	151
4	662	673	e420	e320	e400	307	272	526	1,460	2,300	434	148
5	637	662	e410	e330	e350	304	286	559	1,330	1,970	383	146
6	629	642	e410	e340	e320	302	287	608	1,460	1,700	314	142
7	600	634	e420	e330	e280	302	277	914	2,020	1,610	268	132
8	569	629	e420	e320	e290	321	285	1,230	2,220	1,650	254	124
9	559	627	e430	e320	e300	321	421	1,120	2,000	1,660	225	119
10	529	622	e440	e340	e320	326	415	1,340	1,740	1,730	223	117
11	520	640	e450	e350	e340	324	346	2,410	1,510	2,180	237	115
12	502	625	e420	e350	e360	325	318	2,500	1,410	2,200	256	123
13	506	589	e400	e330	e340	321	299	1,450	1,670	1,910	313	139
14	513	546	e400	e310	e320	318	318	1,270	1,510	1,580	354	148
15	609	530	e410	e300	e300	290	386	1,390	1,450	1,450	323	154
16	643	542	e400	e320	e290	286	377	1,670	2,040	1,330	273	158
17	628	541	e410	e350	e300	321	328	2,440	2,890	1,230	216	168
18	616	557	e400	e380	e310	303	368	2,550	3,770	1,120	200	174
19	614	556	e410	e410	e320	294	518	2,200	4,150	933	254	176
20	606	533	e390	e430	e330	287	541	3,870	4,120	706	559	156
21	616	509	e350	e410	332	299	513	5,260	4,320	604	490	145
22	619	448	e290	e400	316	297	532	5,700	4,560	480	394	144
23	617	441	e220	e410	312	299	e560	5,250	5,010	434	330	150
24	625	505	e230	e390	305	304	e590	5,450	5,480	382	290	194
25	628	537	e290	e380	305	295	626	4,490	5,160	371	287	312
26	616	521	e340	e380	311	280	681	3,340	4,270	405	268	492
27	613	516	e360	e380	309	286	781	2,730	3,480	489	234	460
28	628	479	e380	e390	308	285	734	2,540	3,050	345	206	424
29	906	e460	e400	e390	---	286	653	2,640	2,960	299	172	427
30	991	e430	e380	e390	---	290	599	2,650	2,620	267	155	483
31	720	---	e360	e380	---	287	---	2,270	---	231	148	---
TOTAL	19,659	16,891	11,840	11,120	9,168	9,387	13,108	71,998	83,080	38,916	8,738	6,124
MEAN	634	563	382	359	327	303	437	2,323	2,769	1,255	282	204
MAX	991	673	450	430	410	326	781	5,700	5,480	2,470	559	492
MIN	502	430	220	300	280	280	261	520	1,330	231	148	115
AC-FT	38,990	33,500	23,480	22,060	18,180	18,620	26,000	142,800	164,800	77,190	17,330	12,150

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 2005, BY WATER YEAR (WY)*

MEAN	532	502	409	351	350	364	556	2,095	4,034	2,005	603	472
MAX	1,010	777	593	512	584	554	1,398	5,578	7,256	4,771	1,541	1,395
(WY)	(1942)	(1928)	(1996)	(1997)	(1963)	(1943)	(1943)	(1928)	(1996)	(1943)	(1951)	(1941)
MIN	298	310	217	200	180	220	123	757	1,768	290	49.5	156
(WY)	(1956)	(1936)	(1937)	(1922)	(1922)	(1924)	(1961)	(1968)	(1987)	(1988)	(1988)	(1988)

SUMMARY STATISTICS	FOR 2004 CALENDAR YEAR		FOR 2005 WATER YEAR		WATER YEARS 1921 - 2005*	
ANNUAL TOTAL	282,375		300,029			
ANNUAL MEAN	772		822		1,024	
HIGHEST ANNUAL MEAN					1,623	1997
LOWEST ANNUAL MEAN					644	2001
HIGHEST DAILY MEAN	6,360	Jun 11	5,700	May 22	10,600	Jun 2, 1936
LOWEST DAILY MEAN	43	Apr 28	115	Sep 11	37	May 11, 1961
ANNUAL SEVEN-DAY MINIMUM	131	Apr 23	124	Sep 7	43	Apr 18, 1961
MAXIMUM PEAK FLOW			6,260	May 21	11,100	Jun 12, 1997
MAXIMUM PEAK STAGE			7.18	May 21	9.30	Jun 12, 1997
INSTANTANEOUS LOW FLOW					36	Apr 22, 1961
ANNUAL RUNOFF (AC-FT)	560,100		595,100		741,700	
10 PERCENT EXCEEDS	1,810		2,200		2,810	
50 PERCENT EXCEEDS	518		410		467	
90 PERCENT EXCEEDS	290		231		270	

*--During period of operation (water years 1921-69, 1987 to current year).
e--Estimated.

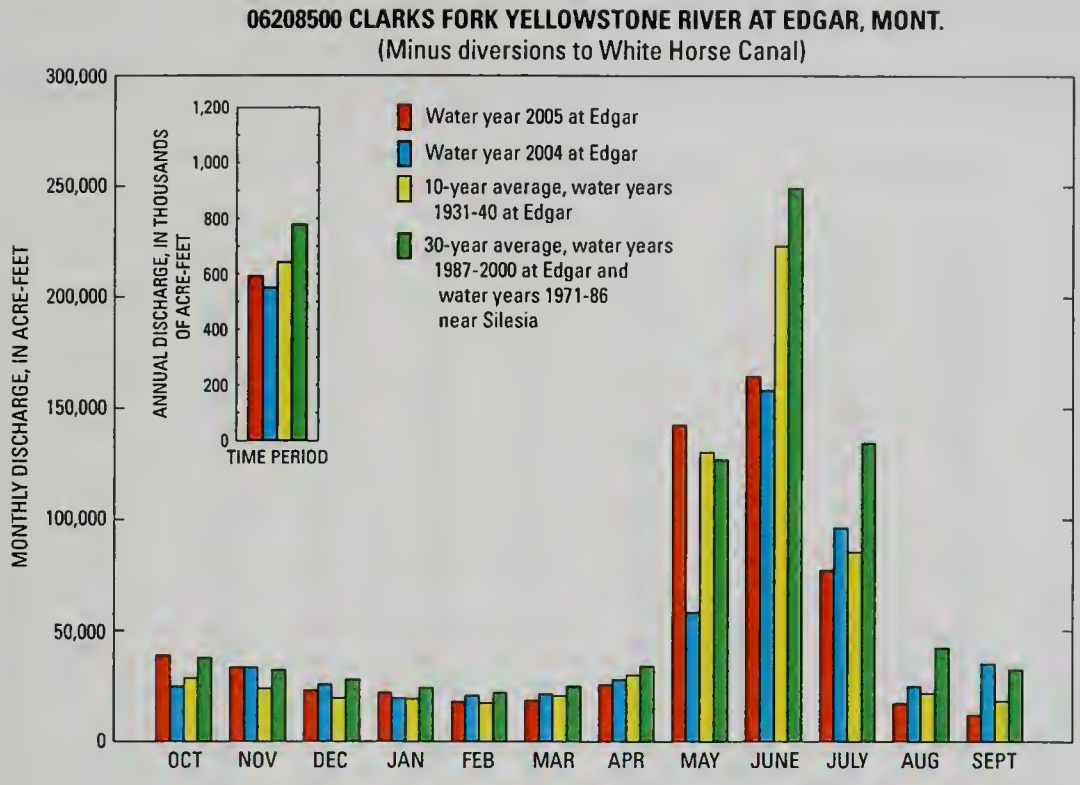


Figure 1. Comparison of discharge of the Clarks Fork Yellowstone River at Edgar, Mont., during water year 2005 with discharge during water year 2004 and with 10-year (1931-40) and 30-year (1971-2000) average discharges.

06294000 Little Bighorn River near Hardin, Mont.

LOCATION.--Lat 45°44'09", long 107°33'24" (NAD 27), in SE¼NE¼NE¼ sec.19, T.1 S., R.34 E., Big Horn County, Hydrologic Unit 10080016, on left bank 50 ft downstream from bridge on Sarpy Road, 0.2 mi upstream from terminal wasteway of Agency Canal, 0.6 mi upstream from mouth, and 2.3 mi east of Hardin.

DRAINAGE AREA.--1,294 mi^2.

PERIOD OF RECORD.--June 1953 to current year.

REVISED RECORDS.--WDR MT-86-1: 1978.

GAGE.--Water-stage recorder. Elevation of gage is 2,882.29 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to Oct. 7, 1953, nonrecording gage at site 0.4 mi downstream. Oct. 7, 1953 to May 6, 1963, water-stage recorder at site 0.3 mi downstream. May 6, 1963 to Nov. 6, 1963, nonrecording gage at site 0.4 mi downstream. All at different elevations. Nov. 7, 1963 to Aug. 15, 1976, water-stage recorder at site 35 ft downstream at present elevation. Aug. 15, 1976 to Sept. 30, 1979, water-stage recorders were located on each bank downstream from Sarpy Road bridge and were used depending on control conditions.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow partly regulated by Willow Creek Reservoir (capacity 23,000 acre-ft). Diversions for irrigation of 20,980 acres upstream from station. **Discharge values given herein include flow of terminal wasteway of Agency Canal.** U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	79	115	e70	e60	e55	82	86	102	369	286	39	36
2	78	110	92	e45	e60	81	85	100	384	269	34	37
3	77	107	110	e50	e60	81	84	101	372	252	31	45
4	74	100	106	e50	e70	82	83	99	337	250	31	46
5	74	104	e90	e50	e60	81	82	95	321	243	30	46
6	73	106	e80	e45	e54	81	82	89	317	227	30	48
7	100	103	e90	e50	e52	80	73	90	335	211	34	40
8	90	101	e90	e60	e50	80	68	118	406	196	31	40
9	84	100	e100	e55	e56	81	106	352	417	181	31	39
10	84	96	106	e50	e70	83	120	511	391	165	29	48
11	83	96	115	e50	e70	85	143	456	355	155	29	46
12	72	96	e100	e45	e74	88	133	700	329	149	35	42
13	73	96	e90	e40	e80	87	116	1,060	330	119	46	50
14	80	95	e80	e35	e76	88	103	591	358	105	47	54
15	92	92	e80	e30	e70	90	87	447	344	113	50	63
16	87	95	e90	e35	e70	89	84	391	334	106	57	72
17	102	93	e90	e40	e70	87	84	363	340	101	52	72
18	102	92	e90	e50	e70	91	81	459	345	96	44	77
19	101	92	e90	e60	e70	90	90	527	363	87	36	75
20	100	94	e90	e60	e75	88	139	488	352	56	29	64
21	102	92	e80	e55	e72	86	181	600	341	47	38	67
22	99	89	e60	e50	e70	85	192	788	317	33	39	64
23	103	95	e45	e55	e72	85	168	860	298	28	30	54
24	111	95	e70	e60	e76	89	155	790	301	23	30	56
25	106	96	e80	e60	e80	88	150	776	340	23	29	66
26	102	e90	e80	e60	e76	88	135	668	352	39	32	69
27	100	e90	e75	e55	e80	89	125	527	361	36	36	72
28	97	e70	e75	e50	e80	92	122	456	341	58	38	85
29	110	e60	e80	e55	---	88	116	420	335	56	38	98
30	114	e50	e75	e55	---	88	108	427	306	44	31	91
31	120	---	e70	e50	---	86	---	402	---	39	31	---
TOTAL	2,869	2,810	2,639	1,565	1,918	2,659	3,381	13,853	10,391	3,793	1,117	1,762
MEAN	92.5	93.7	85.1	50.5	68.5	85.8	113	447	346	122	36.0	58.7
MAX	120	115	115	60	80	92	192	1,060	417	286	57	98
MIN	72	50	45	30	50	80	68	89	298	23	29	36
AC-FT	5,690	5,570	5,230	3,100	3,800	5,270	6,710	27,480	20,610	7,520	2,220	3,490

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 2005, BY WATER YEAR (WY)

MEAN	152	150	133	138	197	305	305	598	799	257	115	125
MAX	276	248	223	366	610	987	748	2,852	1,981	1,333	382	267
(WY)	(1979)	(1979)	(1979)	(1975)	(1971)	(1972)	(1965)	(1978)	(1968)	(1975)	(1975)	(1978)
MIN	60.7	82.6	65.6	50.5	68.5	71.1	54.8	71.9	117	8.50	2.46	19.1
(WY)	(2002)	(2002)	(2002)	(2005)	(2005)	(2002)	(1961)	(1961)	(1961)	(1961)	(1961)	(1960)

SUMMARY STATISTICS	FOR 2004 CALENDAR YEAR		FOR 2005 WATER YEAR		WATER YEARS 1954 - 2005	
ANNUAL TOTAL	37,404		48,757			
ANNUAL MEAN	102		134		273	
HIGHEST ANNUAL MEAN					676	1975
LOWEST ANNUAL MEAN					70.4	1961
HIGHEST DAILY MEAN	403	Feb 26	1,060	May 13	15,800	May 20, 1978
LOWEST DAILY MEAN	25	Jul 24	23	Jul 24	0.30	Aug 5, 1961
ANNUAL SEVEN-DAY MINIMUM	37	May 1	31	Aug 5	0.40	Aug 3, 1961
MAXIMUM PEAK FLOW			1,210	May 13	a22,600	May 19, 1978
MAXIMUM PEAK STAGE			4.55	May 13	b11.78	Mar 20, 1960
INSTANTANEOUS LOW FLOW					c0.20	Aug 7, 1961
ANNUAL RUNOFF (AC-FT)	74,190		96,710		197,600	
10 PERCENT EXCEEDS	161		344		591	
50 PERCENT EXCEEDS	95		85		160	
90 PERCENT EXCEEDS	49		39		71	

a--Gage height, 11.20 ft.
b--Site and datum then in use.
c--Result of discharge measurement.
e--Estimated.

06294500 Bighorn River above Tullock Creek, near Bighorn, Mont.

LOCATION.--Lat 46°07'29", long 107°28'06" (NAD 27), in SE¼SE¼NE¼ sec.3, T.4 N., R.34 E., Treasure County, Hydrologic Unit 10080015, on right bank 1.9 mi upstream from Tullock Creek, 3.6 mi southwest of Bighorn, 4.5 mi southeast of Custer, and at river mile 3.0.

DRAINAGE AREA.--22,414 mi^2. Area at site used Oct. 7, 1955, to Sept. 30, 1981, 22,885 mi^2.

PERIOD OF RECORD.--October 1981 to current year. Previously published as "06294700 Bighorn River at Bighorn, MT" from 1956-81, and as "06294700 Bighorn River near Custer" from 1945-55. Flows are equivalent at all sites.

GAGE.--Water-stage recorder. Elevation of gage is 2,700 ft (NGVD 29). May 11, 1945 to Dec. 6, 1945, nonrecording gage, and Dec. 7, 1945 to Oct. 6, 1955, water-stage recorder 1.7 mi upstream at different elevation. Oct. 7, 1955 to Sept. 30, 1981, at site 2.3 mi downstream at different elevation.

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Flow regulated by Bighorn Lake beginning November 1965 (usable capacity, 1,312,000 acre-ft). Major regulation prior to November 1965 by 14 reservoirs in Wyoming and 1 in Montana with combined usable capacity of about 1,400,000 acre-ft. Diversion for irrigation of about 445,200 acres upstream from station. U.S. Army Corps of Engineers satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,280	1,590	1,790	1,660	1,810	1,800	1,490	1,480	2,160	7,570	2,360	2,050
2	1,320	1,580	1,830	e1,700	1,790	1,830	1,490	1,440	2,290	7,470	2,260	2,110
3	1,410	1,570	1,870	e1,700	1,770	1,730	1,500	1,320	2,740	7,450	2,310	2,110
4	1,390	1,580	1,910	e1,700	1,790	1,760	1,480	1,400	2,800	7,400	2,290	2,160
5	1,400	1,590	1,910	e1,800	1,810	1,760	1,470	1,370	2,810	7,330	2,250	2,200
6	1,400	1,590	1,900	e1,800	1,710	e1,700	1,460	1,370	2,840	7,300	2,250	2,140
7	1,420	1,580	1,950	e1,800	1,690	e1,700	1,460	1,400	2,960	7,210	2,190	2,080
8	1,390	1,580	2,000	e1,800	1,690	e1,700	1,470	1,430	3,170	7,060	2,150	1,980
9	1,470	1,600	2,020	e1,800	e1,700	e1,700	1,670	1,490	3,340	6,940	2,110	1,970
10	1,440	1,600	2,030	e1,800	1,730	e1,700	1,650	1,900	3,940	6,800	2,070	1,940
11	1,420	1,600	2,060	e1,800	1,730	e1,600	1,620	2,010	4,470	6,930	2,000	1,930
12	1,450	1,610	2,090	e1,800	1,730	e1,600	1,630	2,520	4,940	6,270	1,940	1,930
13	1,430	1,620	2,050	e1,800	1,730	e1,600	1,590	3,220	4,960	5,040	1,950	1,990
14	1,410	1,630	2,050	e1,800	1,730	e1,600	1,540	2,680	4,900	3,900	1,950	1,940
15	1,480	1,640	2,120	e1,700	1,710	e1,600	1,570	2,200	4,830	3,260	1,880	1,920
16	1,470	1,640	2,140	e1,700	1,690	1,610	1,500	1,980	4,670	2,670	1,810	1,880
17	1,440	1,640	2,180	e1,700	1,700	1,590	1,430	1,860	4,960	2,300	1,860	1,840
18	1,460	1,650	2,200	e1,700	1,690	1,580	1,430	1,970	4,840	2,270	2,120	1,860
19	1,450	1,660	2,230	e1,700	1,690	1,570	1,550	2,070	4,810	2,200	2,340	1,850
20	1,440	1,680	2,280	e1,700	1,710	1,560	1,710	1,990	4,870	2,150	2,270	1,810
21	1,440	1,700	2,270	e1,700	1,730	1,540	1,930	1,990	4,770	2,150	2,240	1,770
22	1,450	1,690	2,250	e1,700	1,700	1,550	2,110	2,160	4,710	2,100	2,180	2,250
23	1,430	1,720	e2,200	e1,700	1,690	1,530	2,020	2,350	5,190	2,120	2,120	2,720
24	1,460	1,740	e2,300	e1,800	1,700	1,590	1,870	2,280	5,770	2,320	2,070	2,710
25	1,440	1,750	2,300	e1,800	1,700	1,550	1,750	2,240	6,740	2,310	2,140	2,720
26	1,490	1,770	2,340	e1,800	1,700	1,530	1,620	2,170	7,530	2,400	2,100	2,700
27	1,520	1,770	2,360	e1,800	1,720	1,530	1,570	1,980	7,730	2,380	2,090	2,660
28	1,530	1,780	2,320	e1,800	1,770	1,520	1,500	1,800	7,700	2,410	2,100	2,610
29	1,590	1,770	1,980	e1,800	---	1,510	1,520	1,700	7,970	2,400	2,110	2,550
30	1,580	1,750	1,670	1,770	---	1,500	1,490	1,700	7,880	2,360	2,080	2,460
31	1,580	---	1,640	1,760	---	1,490	---	1,760	---	2,370	2,040	---
TOTAL	44,880	49,670	64,240	54,390	48,310	50,130	48,090	59,230	143,290	134,840	65,630	64,840
MEAN	1,448	1,656	2,072	1,755	1,725	1,617	1,603	1,911	4,776	4,350	2,117	2,161
MAX	1,590	1,780	2,360	1,800	1,810	1,830	2,110	3,220	7,970	7,570	2,360	2,720
MIN	1,280	1,570	1,640	1,660	1,690	1,490	1,430	1,320	2,160	2,100	1,810	1,770
AC-FT	89,020	98,520	127,400	107,900	95,820	99,430	95,390	117,500	284,200	267,500	130,200	128,600

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 2005, BY WATER YEAR (WY)

MEAN	3,151	3,224	3,086	2,973	3,133	3,610	3,465	4,275	6,788	5,213	2,804	2,796
MAX	5,546	5,599	4,907	5,478	5,314	6,580	7,881	9,102	15,180	19,090	6,972	4,952
(WY)	(1972)	(1974)	(1968)	(1968)	(1971)	(1972)	(1997)	(1947)	(1948)	(1967)	(1997)	(1973)
MIN	1,103	1,223	1,280	1,382	1,544	908	1,063	1,304	1,050	707	868	1,009
(WY)	(2003)	(1978)	(1961)	(1961)	(2003)	(1966)	(1966)	(1966)	(1966)	(1960)	(1961)	(1966)

SUMMARY STATISTICS	FOR 2004 CALENDAR YEAR		FOR 2005 WATER YEAR		WATER YEARS 1945 - 2005	
ANNUAL TOTAL	584,800		827,540			
ANNUAL MEAN	1,598		2,267		3,693	
HIGHEST ANNUAL MEAN					5,594	1997
LOWEST ANNUAL MEAN					1,474	2003
HIGHEST DAILY MEAN	2,420	Jun 11	7,970	Jun 29	50,000	May 20, 1978
LOWEST DAILY MEAN	1,060	Sep 1	1,280	Oct 1	400	Apr 4, 1967
ANNUAL SEVEN-DAY MINIMUM	1,120	Aug 26	1,370	Oct 1	528	May 6, 1961
MAXIMUM PEAK FLOW			8,190	Jun 29	a59,200	May 20, 1978
MAXIMUM PEAK STAGE			4.56	Jun 29	b14.21	Apr 2, 1965
INSTANTANEOUS LOW FLOW					275	Nov 15, 1959
ANNUAL RUNOFF (AC-FT)	1,160,000		1,641,000		2,675,000	
10 PERCENT EXCEEDS	1,960		3,290		6,200	
50 PERCENT EXCEEDS	1,560		1,800		3,110	
90 PERCENT EXCEEDS	1,290		1,470		1,610	

SUMMARY STATISTICS	WATER YEARS 1946 - 1961 *		WATER YEARS 1967 - 2005**	
ANNUAL MEAN	3,358		3,707	
HIGHEST ANNUAL MEAN	5,501	1947	5,594	1997
LOWEST ANNUAL MEAN	1,623	1961	1,474	2003
HIGHEST DAILY MEAN	25,700	Jun 23, 1947	50,000	May 20, 1978
LOWEST DAILY MEAN	462	May 12, 1961	400	Apr 4, 1967
ANNUAL SEVEN-DAY MINIMUM	528	May 6, 1961	843	Nov 18, 1977
MAXIMUM PEAK FLOW	c26,200	Jun 24, 1947	59,200	May 20, 1978
MAXIMUM PEAK STAGE	10.65	May 20, 1947	14.15	May 20, 1978
INSTANTANEOUS LOW FLOW	275	Nov 15, 1959		
ANNUAL RUNOFF (AC-FT)	2,578,000		2,686,000	
10 PERCENT EXCEEDS	6,200		6,150	
50 PERCENT EXCEEDS	2,810		3,290	
90 PERCENT EXCEEDS	1,500		1,690	

*Prior to construction of Yellowtail Dam.
**--After completion of Yellowtail Dam.
a--Gage height, 14.15 ft, at different site and datum.
b--About, result of ice jam, at different site and datum.
c--Gage height, 8.79 ft, at different site and datum.
e--Estimated.

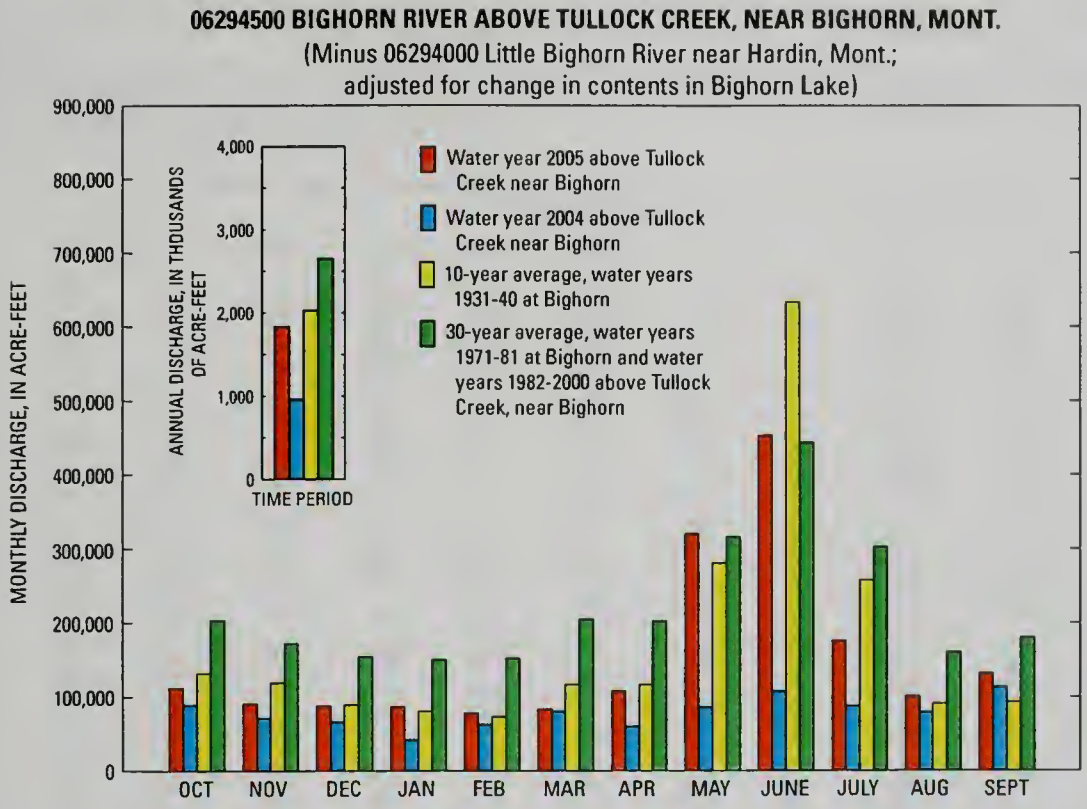


Figure 2. Comparison of discharge of the Bighorn River above Tullock Creek, near Bighorn, Mont., during water year 2005 with discharge during water year 2004 and with 10-year (1931-40) and 30-year (1971-2000) average discharges.

06308500 Tongue River at Miles City, Mont.

LOCATION.--Lat 46°23'05", long 105°50'41" (NAD 27), in SE¼SE¼SE¼ sec. 4, T.7 N., R.47 E., Custer County, Hydrologic Unit 10090102, on right bank 1.5 mi south of Miles City and at river mile 2.3.

DRAINAGE AREA.--5,397 mi^2. Area at site used prior to Oct. 4, 1995, 5,379 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1938 to April 1942, April 1946 to current year. Published as "near Miles City" April 1938 to April 1942. Not equivalent to records published as "near Miles City" May 1929 to October 1932. April 1946 to Oct. 4, 1995, at site 2.5 mi upstream from present site. Flows at present site are equivalent with flows at site operated from 1946. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,360 ft (NGVD 29). April 1938 to April 1942, nonrecording gage at site 8 mi upstream from present site at different elevation. April 1946 to Sept. 30, 1963, at elevation 1.00 ft higher than present site. Oct. 4, 1995, gage was moved 2.5 miles downstream.

REMARKS.--Water-discharge records good except estimated daily discharges for July 10, July 27 to Aug. 2, which are fair, and estimated daily discharges for Nov. 22-30, Dec. 9, 10, and Dec. 18 to Mar. 3, which are poor. Flow regulation by Tongue River Reservoir (station 0630700) with capacity of 79,100 acre-feet, and many small reservoirs in Wyoming with combined capacity about 15,000 acre-ft. Diversions for irrigation of about 100,800 acres upstream from station. U.S. Army Corps of Engineers satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	76	136	72	e50	e80	e100	99	105	1,410	1,310	e170	123
2	78	127	100	e50	e80	e100	99	107	1,500	1,150	e170	126
3	78	121	138	e50	e80	e110	97	64	1,530	1,110	168	126
4	78	114	146	e60	e80	110	86	17	1,300	1,110	138	129
5	74	111	120	e60	e60	110	86	12	1,210	970	138	134
6	75	110	98	e60	e50	107	90	12	1,140	852	116	158
7	76	109	63	e60	e40	106	80	38	1,130	760	88	170
8	78	109	62	e60	e45	105	68	467	2,040	610	85	182
9	75	109	e80	e60	e45	103	73	752	2,880	513	113	171
10	52	108	e100	e60	e45	102	104	485	1,490	e450	114	173
11	43	109	143	e60	e60	100	128	343	1,420	393	104	183
12	44	109	e120	e50	e80	99	115	320	1,380	322	116	180
13	45	108	105	e40	e100	101	101	584	1,310	301	137	217
14	41	110	95	e40	e90	103	97	1,890	1,240	248	163	223
15	43	109	92	e45	e90	103	92	1,450	1,230	211	167	233
16	44	109	108	e50	e80	103	90	1,330	1,270	181	151	224
17	46	109	140	e60	e90	103	86	1,260	1,340	180	166	219
18	55	109	e140	e70	e90	101	82	1,250	1,300	173	179	207
19	79	109	e130	e90	e90	100	84	1,060	1,280	155	203	207
20	133	109	e100	e100	e90	101	105	1,060	1,430	136	212	200
21	125	110	e80	e70	e100	104	239	1,210	1,650	119	213	194
22	117	e100	e70	e60	e100	102	284	1,180	1,860	106	189	121
23	116	e100	e50	e70	e100	102	169	1,260	1,900	109	207	104
24	115	e80	e70	e90	e110	107	135	1,560	1,840	118	157	96
25	111	e100	e100	e80	e110	106	113	2,050	1,810	113	144	109
26	110	e130	e90	e80	e100	107	115	2,270	1,680	180	139	121
27	109	e120	e80	e80	e100	106	111	2,310	1,820	e170	138	91
28	109	e100	e80	e80	e100	103	108	2,210	1,550	e170	148	83
29	149	e60	e80	e80	---	104	106	1,960	2,000	e160	137	85
30	210	e70	e70	e80	---	104	106	1,740	1,650	e160	131	76
31	168	---	e60	e80	---	102	---	1,570	---	e170	124	---
TOTAL	2,752	3,214	2,982	2,025	2,285	3,214	3,348	31,926	46,590	12,710	4,625	4,665
MEAN	88.8	107	96.2	65.3	81.6	104	112	1,030	1,553	410	149	156
MAX	210	136	146	100	110	110	284	2,310	2,880	1,310	213	233
MIN	41	60	50	40	40	99	68	12	1,130	106	85	76
AC-FT	5,460	6,370	5,910	4,020	4,530	6,370	6,640	63,330	92,410	25,210	9,170	9,250

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2005, BY WATER YEAR (WY)*

MEAN	239	248	187	191	272	521	427	682	1,249	456	178	196
MAX	694	585	423	529	1,794	1,783	1,693	2,983	3,825	2,207	700	599
(WY)	(1972)	(1942)	(1950)	(1999)	(1971)	(1971)	(1965)	(1978)	(1978)	(1975)	(1975)	(1968)
MIN	10.3	60.9	68.0	65.3	74.5	74.5	12.5	29.2	41.9	12.6	6.08	2.40
(WY)	(1961)	(1989)	(1990)	(2005)	(2003)	(2002)	(1961)	(1961)	(2002)	(1960)	(1949)	(1938)

06308500 Tongue River at Miles City, Mont.--Continued

SUMMARY STATISTICS	FOR 2004 CALENDAR YEAR		FOR 2005 WATER YEAR		WATER YEARS 1938 - 2005*	
ANNUAL TOTAL	30,903.4		120,336			
ANNUAL MEAN	84.4		330		400	
HIGHEST ANNUAL MEAN					986	1978
LOWEST ANNUAL MEAN					57.2	1961
HIGHEST DAILY MEAN	500	Mar 10	2,880	Jun 9	9,290	Jun 15, 1962
LOWEST DAILY MEAN	7.6	May 8	12	May 5	0.00	Jul 9, 1940
ANNUAL SEVEN-DAY MINIMUM	8.5	May 3	44	Oct 11	0.00	Jul 9, 1940
MAXIMUM PEAK FLOW			3,750	Jun 9	a13,300	Jun 15, 1962
MAXIMUM PEAK STAGE			7.40	Jun 9	b12.27	Mar 19, 1960
INSTANTANEOUS LOW FLOW					0.00	Jul 9, 1940
ANNUAL RUNOFF (AC-FT)	61,300		238,700		290,100	
10 PERCENT EXCEEDS	163		1,270		906	
50 PERCENT EXCEEDS	79		109		220	
90 PERCENT EXCEEDS	16		60		65	

*--During period of record (April 1938 to April 1942, April 1946 to current year).
a--Gage height, 11.33 ft, at prevous site and datum.
b--Ice jam, at previous site and datum.
e-- Estimated.

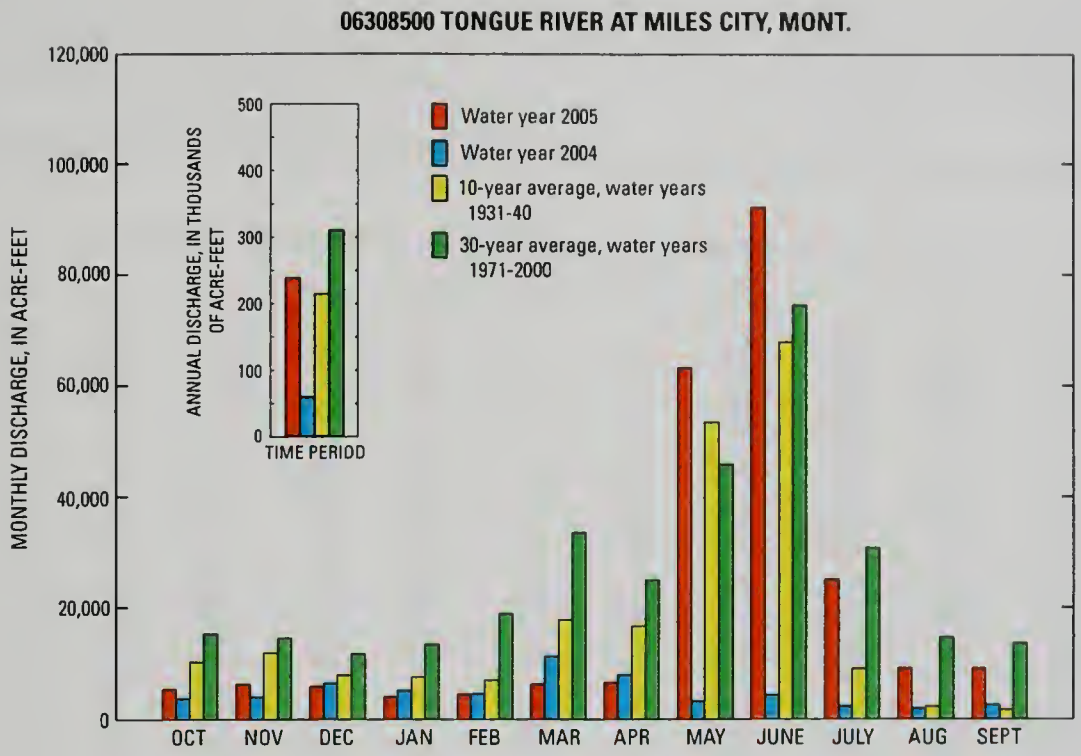


Figure 3. Comparison of discharge of the Tongue River at Miles City, Mont., during water year 2005 with discharge during water year 2004 and with 10-year (1931-40) and 30-year (1971-2000) average discharges.

06326500 Powder River near Locate, Mont.

LOCATION.--Lat 46°25'48", long 105°18'34" (NAD 27), in SW¼SW¼SE¼ sec. 23, T.8 N., R.51 E., Custer County, Hydrologic Unit 10090209, on left bank at downstream side of bridge on U.S. Highway 12, 0.1 mi west of Locate, and 25 mi east of Miles City, and at river mile 29.4.

DRAINAGE AREA.--13,068 mi^2.

PERIOD OF RECORD.--March 1938 to current year.

WATER-DISCHARGE RECORDS

REVISED RECORDS.--WSP 926: 1939. WSP 1309: 1938-39 (M). WSP 1729: Drainage area. WDR MT-04-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,384.79 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to July 11, 1947, nonrecording gage at bridge 1.5 mi upstream, and July 11, 1947 to Sept. 30, 1965, water-stage recorder at site near upstream bridge at different elevation. Oct. 1, 1965 to Oct. 4, 1966, nonrecording gage, and Oct. 5, 1966 to Mar. 21, 1978, water-stage recorder at present site and elevation. Mar. 22, 1978 to Apr. 23, 1981, water-stage recorder 1.5 mi upstream at different elevation, Apr. 24 to Aug. 20, 1981, water-stage recorder at present site and elevation, and Aug. 21, 1981 to Sept. 30, 1981, water-stage recorder 1.5 mi upstream at different elevation. Oct. 1, 1981 to Apr. 5, 1995 water-stage recorder at site 1.5 miles downstream at different elevation. Apr. 7, 1995 to present, water-stage recorders located on each bank and used depending on control conditions.

REMARKS.--Water-discharge records fair except those for estimated daily discharges, which are poor. Some regulation by three reservoirs in Wyoming with combined usable capacity of 36,800 acre-ft. Diversions for irrigation of about 101,800 acres upstream from station. U.S. Army Corps of Engineers satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	190	e30	e60	e210	e250	160	e350	1,250	1,490	60	65
2	39	160	e50	e50	e250	e300	141	e350	1,810	1,180	54	64
3	38	196	e60	e50	e270	e370	127	e350	1,530	1,080	e50	64
4	37	196	e80	e50	e300	e350	120	e300	1,180	1,160	e60	63
5	35	189	e70	e60	e260	349	129	290	1,160	996	e55	63
6	32	177	e70	e60	e200	335	119	291	1,240	776	e50	62
7	37	176	e70	e80	e150	315	115	304	1,170	705	e45	55
8	47	179	e80	e100	e160	292	121	649	3,020	642	e45	54
9	44	182	e90	e90	e190	270	131	665	2,240	583	e50	50
10	34	180	e90	e80	e230	251	215	392	1,350	526	45	50
11	51	172	e100	e70	e250	233	156	377	1,230	472	33	48
12	46	167	e100	e60	e270	229	123	802	1,080	411	29	48
13	52	167	e90	e40	e250	215	131	1,170	1,340	354	31	61
14	46	165	e80	e50	e240	204	137	2,720	1,220	267	45	61
15	57	163	e100	e60	e230	203	132	2,900	996	206	48	60
16	70	155	e90	e70	e230	216	163	2,900	889	183	57	54
17	69	156	e90	e100	e220	224	174	2,720	1,120	180	61	59
18	70	154	e90	e140	e240	207	152	2,470	966	159	67	60
19	110	156	e90	e170	e230	203	170	2,070	1,040	135	60	44
20	126	154	e90	e200	e230	210	215	2,030	1,160	113	63	41
21	110	140	e80	e170	e250	205	292	2,050	1,270	103	78	38
22	111	140	e70	e150	e260	216	239	1,950	1,360	89	77	37
23	123	136	e50	e140	e270	222	196	2,110	1,340	78	88	37
24	137	134	e60	e200	e280	225	214	2,310	1,370	65	89	36
25	139	156	e70	e200	e280	223	242	2,420	1,350	60	100	36
26	147	172	e100	e190	e270	232	e260	2,350	1,450	56	97	35
27	148	154	e90	e200	e260	232	e280	2,270	3,120	53	89	35
28	153	e100	e90	e190	e250	228	e300	1,950	3,390	55	88	36
29	167	e30	e90	e200	---	232	e400	1,670	3,320	66	79	37
30	185	e25	e80	e200	---	224	e400	1,450	2,110	84	72	39
31	214	---	e70	e180	---	190	---	1,350	---	71	69	---
TOTAL	2,713	4,621	2,460	3,660	6,730	7,655	5,754	45,980	47,071	12,398	1,934	1,492
MEAN	87.5	154	79.4	118	240	247	192	1,483	1,569	400	62.4	49.7
MAX	214	196	100	200	300	370	400	2,900	3,390	1,490	100	65
MIN	32	25	30	40	150	190	115	290	889	53	29	35
AC-FT	5,380	9,170	4,880	7,260	13,350	15,180	11,410	91,200	93,370	24,590	3,840	2,960

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 2005, BY WATER YEAR (WY)

MEAN	246	216	148	142	422	1,201	724	1,132	1,577	554	208	165
MAX	921	790	417	476	3,850	4,627	3,062	5,970	8,045	2,015	1,096	898
(WY)	(1941)	(1999)	(1942)	(1981)	(1943)	(1972)	(1965)	(1978)	(1944)	(1993)	(1941)	(1941)
MIN	1.77	12.5	12.5	4.53	2.82	80.2	109	51.2	25.9	9.34	1.30	0.19
(WY)	(1961)	(1961)	(1961)	(1950)	(1950)	(1950)	(1961)	(2004)	(2004)	(2004)	(1988)	(1960)

SUMMARY STATISTICS	FOR 2004 CALENDAR YEAR		FOR 2005 WATER YEAR		WATER YEARS 1939 - 2005	
ANNUAL TOTAL	31,941.8		142,468			
ANNUAL MEAN	87.3		390		561	
HIGHEST ANNUAL MEAN					1,622	1944
LOWEST ANNUAL MEAN					79.1	2004
HIGHEST DAILY MEAN	704	Mar 16	3,390	Jun 28	26,000	Feb 19, 1943
LOWEST DAILY MEAN	2.0	Jul 27	25	Nov 30	0.00	Jan 16, 1950
ANNUAL SEVEN-DAY MINIMUM	2.5	Aug 28	36	Sep 22	0.00	Jan 16, 1950
MAXIMUM PEAK FLOW			4,630	Jun 28	31,000	Feb 19, 1943
MAXIMUM PEAK STAGE			5.65	Jun 28	a12.20	Mar 16, 1978
INSTANTANEOUS LOW FLOW					b0.00	Many days
ANNUAL RUNOFF (AC-FT)	63,360		282,600		406,400	
10 PERCENT EXCEEDS	189		1,240		1,310	
50 PERCENT EXCEEDS	65		159		230	
90 PERCENT EXCEEDS	4.2		48		40	

a--Backwater from ice.
b--On many days in 1950, 1960-61, and 1998.
e--Estimated.

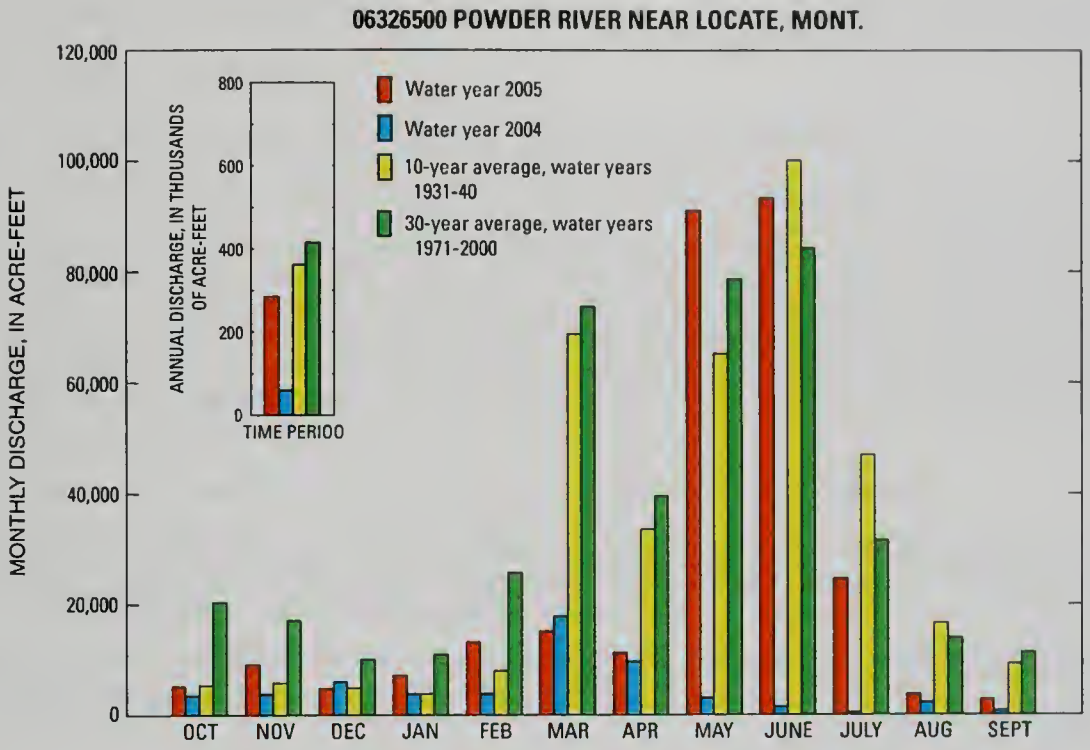


Figure 4. Comparison of discharge of the Powder River near Locate, Mont., during water year 2005 with discharge during water year 2004 and with 10-year (1931-40) and 30-year (1971-2000) average discharges.

MONTH-END CONTENTS FOR YELLOWSTONE RIVER COMPACT RESERVOIRS COMPLETED AFTER JANUARY 1, 1950

06258900 Boysen Reservoir, Wyo.

LOCATION.--Lat 43°25'00", long 108°10'37" (NAD 27), in $NW^1/_4NW^1/_4$ sec. 16, T.5 N., R.6 E., Fremont County, Hydrologic Unit 10080005, at dam on Wind River and 13 mi north of Shoshoni, Wyoming.

DRAINAGE AREA.--7,700 mi^2.

PERIOD OF RECORD.--October 1951 to current year (month-end contents only).

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929 (levels by Bureau of Reclamation).

REMARKS.--Reservoir is formed by rock-fill dam completed in October 1951. Storage began Oct. 11, 1951. Usable capacity, 701,500 acre-ft between elevation 4,657.00 ft, invert of penstock pipe, and 4,725.00 ft, top of spillway gate. Dead storage, 40,080 acre-ft below elevation 4,657.00 ft. Prior to Jan. 1, 1966, usable capacity was 757,800 acre-ft and dead storage was 62,000 acre-ft at same elevations. Between January 1966 and October 1996, usable capacity was 742,100 acre-ft and dead storage was 59,880 acre-ft, at same elevations. Crest of dam is at elevation 4,758.00 ft. Water used for irrigation, flood control, and power generation.

COOPERATION.--Elevations and capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 862,500 acre-ft, July 6, 7, 1967, elevation, 4,730.83 ft; minimum daily contents since normal use of water started, 191,900 acre-ft, Mar. 18, 19, 1956, elevation, 4,684.18 ft, capacity table then in use.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 699,900 acre-ft, June 27, elevation, 4,724.92 ft; minimum daily contents, 477,400 acre-ft, Oct. 1, elevation, 4,711.76 ft.

Date	Water-surface elevation, in feet	Usable contents, in acre-feet	Change in usable contents, in acre-feet
September 30, 2004	4,711.60	475,100	---
October 31	4,714.48	517,700	+42,600
November 30	4,716.48	548,900	+31,200
December 31	4,717.48	565,200	+16,300
January 31, 2005	4,718.51	582,400	+17,200
February 28	4,719.46	598,800	+16,400
March 31	4,720.29	613,400	+14,600
April 30	4,719.02	591,200	-22,200
May 31	4,722.92	661,600	+70,400
June 30	4,724.79	697,400	+35,800
July 31	4,723.37	670,100	-27,300
August 31	4,721.11	628,100	-42,000
September 30, 2005	4,719.06	591,900	-36,200
2005 water year			+116,800

06260300 Anchor Reservoir, Wyo.

LOCATION.--Lat 43°39'50", long 108°49'27" (NAD 27), in sec. 26, T.43 N., R.100 W., Hot Springs County, Hydrologic Unit 10080007, at dam on South Fork Owl Creek, 2 mi downstream from Middle Fork, 3 mi southeast of Anchor, and 32 mi west of Thermopolis, Wyo.

DRAINAGE AREA.--131 mi^2.

PERIOD OF RECORD.--November 1960 to current year (month-end contents only).

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929 (Bureau of Reclamation benchmark).

REMARKS.--Reservoir is formed by concrete arch dam completed in 1960. Usable capacity, 17,410 acre-ft (revised) between elevation 6,343.75 ft, invert of river outlet, and 6,441.00 ft, spillway crest, including 68 acre-ft below elevation 6,343.75 ft. Prior to Oct. 1, 1971, usable capacity was 17,280 acre-ft, including 149 acre-ft below the invert. Water is used for irrigation of land in Owl Creek basin.

COOPERATION.--Elevations and capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 9,250 acre-ft, July 4, 1967, elevation, 6,418.52 ft; no usable contents on many days some years.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 5,090 acre-ft, June 25, elevation, 6,403.33 ft; minimum daily contents, 254 acre-ft, many days, elevation, 6,355.00 ft.

Date	Water-surface elevation, in feet	Usable contents, in acre-feet	Change in usable contents, in acre-feet
September 30, 2004	6,360.40	429	---
October 31	6,356.00	283	-146
November 30	6,355.00	254	-29
December 31	6,356.80	308	+54
January 31, 2005	6,358.80	372	+64
February 28	6,355.80	277	-95
March 31	6,355.00	254	-23
April 30	6,357.00	314	+60
May 31	6,397.69	4,060	+3,746
June 30	6,400.98	4,640	+580
July 31	6,356.00	283	-4,357
August 31	6,355.50	269	-14
September 30, 2005	6,355.50	269	0
2005 water year			-160

06286400 Bighorn Lake near St. Xavier, Mont.

LOCATION.--Lat 45°18'27", long 107°57'26" (NAD 27), in $SW^1/_4SE^1/_4$ sec.18, T.6 S., R.30 E., Big Horn County, Hydrologic Unit 10080010, in block 13 of Yellowtail Dam on Bighorn River, 1.3 mi upstream from Grapevine Creek, 15.5 mi southwest of St. Xavier, Mont., and at river mile 86.6.

DRAINAGE AREA.--19,626 mi^2.

PERIOD OF RECORD.--November 1965 to current year (month-end contents only). Prior to October 1969, published as "Yellowtail Reservoir." Records of daily elevations and contents on file at the USGS Montana Water Science Center office in Helena, Mont.

GAGE.--Water-stage recorder in powerhouse control room. Datum of gage is 3,296.5 feet (levels by Bureau of Reclamation).

REMARKS.--Reservoir is formed from thin concrete-arch dam; construction began in 1961; completed in 1967. Storage began Nov. 3, 1965. Usable capacity, 1,312,000 acre-ft, between elevation 3,296.50 ft, river outlet invert, and 3,657.00 ft, top of flood control. Elevation of spillway crest, 3,593.00 ft. Normal maximum operating level, 1,097,000 acre-ft, elevation, 3,640.00 ft. Minimum operating level, 483,400 acre-ft, elevation, 3,547.00 ft. Dead storage, 16,010 acre-ft, below elevation 3,296.50 ft. Water is used for power production, flood control, irrigation, and recreation.

COOPERATION.--Elevations and capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,346,000 acre-ft, July 6, 1967, elevation, 3,656.43 ft; minimum contents since first filling, 591,400 acre-ft, Mar. 11, 2003, elevation, 3,572.81 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,091,000 acre-ft, July 1, elevation, 3,642.82 ft; minimum contents, 641,900 acre-ft, Apr. 8, elevation, 3,583.29 ft.

Date	Water-surface elevation, in feet	Usable contents, in acre-feet	Change in usable contents, in acre-feet
September 30, 2004	3,593.63	694,300	---
October 31	3,599.05	723,400	+29,100
November 30	3,598.85	722,300	-1,100
December 31	3,592.50	688,400	-33,900
January 31, 2005	3,589.03	670,600	-17,800
February 28	3,586.40	657,300	-13,300
March 31	3,584.32	646,900	-10,400
April 30	3,588.21	666,400	+19,500
May 31	3,624.91	897,400	+231,000
June 30	3,642.66	1,088,000	+190,600
July 31	3,635.85	1,004,000	-84,000
August 31	3,633.33	977,100	-26,900
September 30, 2005	3,634.03	984,500	+7,400
2005 water year			+290,200

MONTH-END CONTENTS FOR YELLOWSTONE RIVER COMPACT RESERVOIRS EXISTING ON JANUARY 1, 1950

The extent, if any, to which the use of reservoirs in this section may be subject to Compact allocations was not determined. As a matter of hydrologic interest, the month-end usable contents in acre-feet of four reservoirs are given. The first three reservoirs are in the Bighorn River basin, Wyoming, and data on contents were furnished by the Bureau of Reclamation. The Tongue River Reservoir in Montana is operated under the supervision of the Water Resources Division of the Montana Department of Natural Resources and Conservation, which furnished the water-level data and the reservoir-capacity table.

Date	Usable contents, in acre-feet[1]			
	06224500 Bull Lake	Pilot Butte Reservoir	06281500 Buffalo Bill Reservoir	06307000 Tongue River Reservoir
September 30, 2004	88,940	15,630	438,800	26,620
October 31	96,770	24,660	440,200	30,960
November 30	100,800	24,340	455,100	33,940
December 31	102,200	24,210	461,000	35,940
January 31, 2005	103,600	24,140	466,900	38,830
February 28	104,000	24,000	470,600	41,420
March 31	104,100	23,800	475,100	43,500
April 30	104,600	20,320	483,200	47,410
May 31	138,300	28,830	598,300	78,740
June 30	148,900	28,500	625,500	78,360
July 31	145,300	22,230	592,600	65,990
August 31	119,300	14,580	518,100	52,310
September 30, 2005	66,100	12,300	450,300	43,760
Change in contents during water year	-22,840	-3,330	+11,500	+17,140

[1]Pre-Compact water rights and post-Compact water rights for these reservoirs are presented in the table, "Water-year-end contents for Yellowstone River Compact reservoirs or lakes."

WATER-YEAR-END CONTENTS FOR YELLOWSTONE RIVER COMPACT RESERVOIRS OR LAKES

[Contents are in acre feet. Reservoirs or lakes are listed in alphabetical order by drainage basin. Symbol: --, data not applicable or not available]

Reservoir or lake name	Pre-Compact 1950 water right	Post-Compact 1950 water right	Usable capacity	Usable contents on Sept. 30, 2005	Usable contents on Sept. 30, 2004	Change in contents
Bighorn River basin						
(Lake) Adelaide Reservoir[1]	1,450	4,760	6,210	2,000	800	+1,200
Anchor Reservoir[2]	17,410	0	17,410	269	429	-160
Bighorn Lake[2]	--	1,312,000	1,312,000	984,500	694,300	+290,200
Boysen Reservoir[2]	701,500	0	701,500	591,900	475,100	+116,800
Buffalo Bill Reservoir[2]	456,600	190,000	646,600	450,300	438,800	+11,500
Bull Lake[2]	152,000	0	152,000	66,100	88,940	-22,840
Greybull Valley Reservoir[1]	0	33,170	33,170	8,000	1,100	+6,900
Pilot Butte Reservoir[2]	34,600	0	34,600	12,300	15,630	-3,330
Sunshine Reservoir[1]	52,990	0	52,990	24,000	6,600	+17,400
Lower Sunshine Reservoir[1]	42,640	42,300	84,940	21,000	1,010	+19,990
Powder River basin						
Cloud Peak Reservoir[1]	3,400	172	3,570	3,380	0	+3,380
Dull Knife Reservoir[1]	--	4,320	4,320	1,310	504	+806
Healy Reservoir[1]	--	5,140	5,140	3,660	2,620	+1,040
Kearney Reservoir[1]	1,850	4,470	6,320	2,500	2,500	0
Lake DeSmet[1]	37,520	197,500	235,000	206,700	185,600	+21,100
Muddy Guard Reservoir[1]	--	2,340	2,340	993	0	+993
Tie Hack Reservoir[1]	1,650	2,440	2,440	2,440	2,440	0
Willow Park Reservoir[1]	4,460	--	4,460	325	2,230	-1,905
Tongue River basin						
Bighorn Reservoir[1]	2,750	1,880	4,630	1,300	794	+506
Cross Creek Reservoir[1]	--	798	798	258	0	+258
Dome Reservoir[1,3]	1,840	188	2,030	1,230	1,180	+50
Granger Reservoir[1]	146	--	146	0	0	0
Last Chance Reservoir[1]	90	--	90	0	0	0
Martin Reservoir[1]	561	--	561	0	0	0
Park Reservoir[1]	7,350	3,020	10,360	4,920	4,160	+760
Sawmill Lakes Reservoir[1]	--	1,280	1,280	790	703	+87
Tongue River Reservoir[4]	68,000	11,070	79,070	43,760	26,620	+17,140
Twin Lakes Reservoir[1,5]	1,180	2,220	3,400	2,920	3,100	-180
Weston Reservoir[1]	370	--	370	0	0	0
Willits Reservoir[1]	79	--	79	0	0	0

[1]Reservoirs managed by the State of Wyoming
[2]Reservoirs managed by Bureau of Reclamation.
[3]Data are combined contents of Dome Lake and Dome Lake Reservoir.
[4]Reservoir managed by the State of Montana.
[5]Data are combined contents of Twin Lakes Number 1 and Twin Lakes Number 2.

RULES AND REGULATIONS FOR ADMINISTRATION OF THE YELLOWSTONE RIVER COMPACT

A compact, known as the Yellowstone River Compact, between the States of Wyoming, Montana, and North Dakota, having become effective on October 30, 1951, upon approval of the Congress of the United States, which apportions the waters of certain interstate tributaries of the Yellowstone River which are available after the appropriative rights existing in the States of Wyoming and Montana on January 1, 1950 are supplied, and after appropriative rights to the use of necessary supplemental water are also supplied as specified in the Compact, is administered under the following rules and regulations subject to the provisions for amendment revision or abrogation as provided herein.

Article I. Collection of Water Records

A. It shall be the joint and equal responsibility of the members of the States of Wyoming and Montana to collect, cause to be collected, or otherwise furnish records of tributary streamflow at the points of measurement specified in Article V (B) of the Compact, or as near thereto as is physically or economically feasible or justified.

1. Clarks Fork

The gaging station known as Clarks Fork near Silesia, Montana and located in NW1/4 SE1/4 sec. 1, T. 4 S., R. 23 E., shall be the point of measurement for the Clarks Fork.

2. Bighorn River (exclusive of Little Bighorn River)

The gaging station known as the Bighorn River above Tullock Creek, near Bighorn, Montana, and located in SE1/4 SE1/4 NE1/4 sec. 3, T. 4 N., R. 34 E., shall temporarily be the designated point of measurement on that stream. The flow of the Little Bighorn River as measured at the gaging station near Hardin, Montana, and located in SE1/4 NE1/4 NE1/4 sec. 19, T. 1 S., R. 34 E., shall be considered the point of measurement for that stream, except that if or when satisfactory records are not available, the records for the nearest upstream station with practical corrections for intervening inflow or diversion shall be used.

3. Tongue River

The gaging station known as the Tongue River at Miles City, Montana, and located in NE1/4 NE1/4 SE1/4 sec. 23, T. 7 N., R. 47 E., shall temporarily be the point of measurement for that stream.

4. Powder River

The gaging station known as the Powder River near Locate, Montana, and located in NW1/4 SW1/4 sec. 14, T. 8 N., R. 51 E., shall temporarily be the designated point of measurement for that stream.

B. Records of total annual diversion in acre-feet above the points of measurement designated in the Compact for irrigation, municipal, and industrial uses developed after January 1, 1950, shall be furnished by the members of the Commission for their respective States, at such time as the Commission deems necessary for interstate administration as provided by the terms of the Compact. Providing that if it be acceptable to the Commission, reasonable estimates thereof may be substituted.

C. Annual records of the net change in storage in all reservoirs, not excluded under Article V (E) of the Compact, above the point of measurement specified in the Compact and completed after January 1, 1950, and the annual net change in reservoirs existing prior to January 1, 1950, which is used for irrigation, municipal, and industrial purposes developed after January 1, 1950, shall be the primary responsibility of the member of the Commission in whose State such works are located; providing such data are not furnished by Federal agencies under the provisions of Article III (D) of the Compact, or collected by the Commission.

Article II. Office and Officers

A. The office of the Commission shall be located at the office of the Chairman of the Commission.

B. The Chairman of the Commission shall be the Federal representative as provided in the Compact.

C. The Secretary of the Commission shall be as provided for in Article III of these rules.

D. The credentials of each member of the Commission shall be placed on file in the office of the Commission.

Article III. Secretary

A. The Commission, subject to the approval of the Director of the United States Geological Survey, shall enter into cooperative agreements with the U.S. Geological Survey for such engineering and clerical services as may reasonably be necessary for the administration of the Compact. Said agreements shall provide that the Geological Survey shall:

1. Maintain and operate gaging stations at or near the points of measurement specified in Article V (A) of the Compact.

2. Assemble factual information on stream flow, diversion, and reservoir storage for the preparation of an annual report to the Governors of the signatory States.

3. Make such investigations and reports as may be requested by the Commission in aid of its administration of the Compact.

B. The Geological Survey shall act as Secretary to the Commission.

Article IV. Budget

A. At the annual meeting of each even-numbered year or prior thereto, the Commission shall adopt a budget for operation during the ensuing biennium beginning July first. Such budget shall set forth the total cost of construction, maintenance and operation of gaging stations, the cost of engineering and clerical aid, and other necessary expenses excepting the salaries and personal expenses of the Commissioners. On odd-numbered years revisions of the budget shall be considered.

B. It shall be the obligation of the Commissioners of the States of Montana and Wyoming to endeavor to secure from the Legislature of their respective States sufficient funds with which to meet the obligations of this Compact, except insofar as provided by the Federal government.

Article V. Meetings

An annual meeting of the Commission shall be held each November at some mutually agreeable point in the Yellowstone River Basin for consideration of the annual report for the water year ending the preceding September 30th, and for the transaction of such other business consistent with its authority; provided that by unanimous consent of the Commission the date and place of the annual meeting may be changed. Other meetings as may be deemed necessary shall be held at a time and place set by mutual agreement, for the transaction of any business consistent with its authority.

No action of the Commission shall be effective until approval by the Commissioners for the States of Wyoming and Montana.

Article VI. Amendments, Revisions and Abrogations.

The Rules and Regulations of the Commission may be amended or revised by a unanimous vote at any meeting of the Commission.

Gary Fritz
Commissioner for Montana

George L. Christopulos
Commissioner for Wyoming

ATTESTED:

L. Grady Moore
Federal Representative

Adopted November 17, 1953
Amended December 16, 1986

RULES FOR THE RESOLUTION OF DISPUTES OVER THE ADMINISTRATION OF THE YELLOWSTONE RIVER COMPACT

December 19, 1995

Section I. General Framework

According to Article III(F) of the Yellowstone River Compact,

"In case of the failure of the representatives of Wyoming and Montana to unanimously agree on any matter necessary to the proper administration of this compact, then the member selected by the director of the United States Geological Survey shall have the right to vote upon the matters in disagreement and such points of disagreement shall then be decided by a majority vote of the representatives of the states of Wyoming and Montana and said member selected by the director of the United States geological survey, each being entitled to one vote."

Section II. Purpose and Goal

A. The purpose of these rules is to clarify and more fully develop the dispute resolution process outlined in Section I.

B. The goal of the dispute resolution process outlined in these rules is to encourage joint problem solving and consensus building. It consists of three phases -- unassisted negotiation, facilitation, and voting.

C. Any agreement reached through this process is binding on Montana, Wyoming, and the United States Geological Survey (USGS).

D. Either state can initiate the dispute resolution process defined in Sections IV, V, and VI, and the other state is obligated to participate in good faith. The states agree that the issues pursued under this dispute resolution process shall be both substantive and require timely resolution.

Section III. Consensus

A. In the process of administering the Yellowstone River Compact, the representatives from Montana and Wyoming agree to seek consensus.

B. For purposes of this rule, consensus is defined as an agreement that is reached by identifying the interests of Montana and Wyoming and then building an integrative solution that maximizes the satisfaction of as many of the interests as possible. The process of seeking consensus does not involve voting, but a synthesis and blending of alternative solutions.

Section IV. Unassisted Negotiation

A In all situations, the representatives from Montana and Wyoming shall first attempt to seek consensus through unassisted negotiation. The federal representative will not serve as chairperson in the unassisted negotiation process.

B. During a negotiation process, the representatives from Montana and Wyoming shall identify issues about which they differ, educate each other about their needs and interests, generate possible resolution options, and collaboratively seek a mutually acceptable solution.

C. To help facilitate negotiations, the representatives from Montana and Wyoming in cooperation with the USGS agree to share technical information and develop joint data bases. Other data sources may also be used.

D. The USGS shall serve as technical advisor in the two-state negotiations.

Section V. Facilitation

A. If the representatives from Montana and Wyoming are not able to reach consensus through unassisted negotiation, they shall each identify, articulate, and exchange, in writing, the unresolved issues.

B. The representatives from Montana and Wyoming shall then jointly appoint a facilitator to assist in resolving the outstanding dispute. If the representatives from Montana and Wyoming cannot identify a mutually acceptable facilitator, the representative appointed by the USGS shall appoint a facilitator.

C. A facilitator, for purposes of this rule, is defined as a neutral third party that shall help the representatives from Montana and Wyoming communicate, negotiate, and reach agreements voluntarily. The facilitator is not empowered to vote or render a decision.

D. The facilitator shall assist the representatives from Montana and Wyoming in developing appropriate ground rules for each facilitated session including establishing a deadline for completion of the facilitation process, setting an appropriate agenda, identifying issues, collecting and analyzing technical information, developing options, packaging agreements, and preparing a written agreement. The facilitator reserves the right to meet privately with each representative during the facilitation process.

Section VI. Voting

A. If, and only if, the representatives from Montana and Wyoming are unable to reach consensus with the assistance of a facilitator, then a dispute may be settled by voting.

B. The representatives from Montana and Wyoming, along with the representative appointed by the director of the USGS, are each entitled to one vote.

C. If the USGS representative does not vote in accordance with Article III, then the director of the USGS will select, with concurrence from Wyoming and Montana, a neutral third party to vote.

D. If the representative appointed by the director of the USGS is not involved in the steps outlined in Sections IV and V, each state shall have the opportunity to present appropriate information to that representative. This information may be presented through both oral presentations and written documents. All information will be shared with the other state.

   The representative of the USGS may also consult the facilitator referenced in Section V in an attempt to resolve any disputes.

E. The USGS shall pay the expenses of the representative appointed by the director of the USGS.

F. Points of disagreement shall be resolved by a majority vote.

Section VII. Funding

A. The USGS will pay one-half and the states of Montana and Wyoming shall each pay one-quarter of the expenses of the facilitator, which shall not exceed $10,000, unless agreed to by both states and the USGS.

Section VIII. Amendments

A. These rules may be amended or revised by a unanimous vote of the Commission.

Section IX. Execution

These rules for the resolution of disputes over the administration of the Yellowstone River Compact are hereby executed on the date indicated below.

Gary Fritz
Commissioner for Montana

Gordon W. Fassett
Commissioner for Wyoming

William F. Horak
Federal Representative

July 22, 1996
Date

RULES FOR ADJUDICATING WATER RIGHTS ON INTERSTATE DITCHES

Article I. Purpose

The purpose of this rule is to determine and adjudicate, in accordance with the laws of Montana and Wyoming, those pre-Compact (January 1, 1950) water rights diverting from the Powder, Tongue, Bighorn and Clarks Fork Rivers and their tributaries where the point of diversion is in one State and the place of use is in the other State which have not yet been adjudicated.

Article II. Authority

In accordance with the Yellowstone River Compact, the State of Montana and the State of Wyoming, being moved by consideration of interstate comity, desire to remove all causes of present and future controversy between the States and between persons in one State and persons in another State with respect to these interstate ditches. Article III (E) of the Compact provides the Yellowstone River Compact Commission with the authority "...to formulate rules and regulations and to perform any act which they may find necessary to carry out the provisions of this Compact...."

Article III. Definitions

The terms defined in the Yellowstone River Compact apply as well as the following definitions:

1. "Acre-feet" means the volume of water that would cover 1 acre of land to a depth of 1 foot.

2. "Cfs" means a flow of water equivalent to a volume of 1 cubic foot that passes a point in 1 second of time and is equal to 40 miners inches in Montana.

3. "Interstate Ditches" shall include ditches and canals which convey waters of the Bighorn, Tongue, Powder, and Clarks Fork Rivers and their tributaries across the Wyoming-Montana State line where the water is diverted in one State and the place of use is in the other State.

4. "Department of Natural Resources and Conservation," hereafter called the "Department," means the administrative agency and Department of the Executive Branch of the Government of Montana created under Title II, Chapter 15, MCA which has the responsibility for water administration in that State.

5. "Water Court" means a Montana District Court presided over by a water judge, as provided for in Title III, Chapter 7, MCA.

6. "State Engineer" shall be the current holder of the position created by the Wyoming Constitution as Chief Water Administration Official for the State of Wyoming.

7. "Board of Control," hereinafter called the "Board," is defined as the constitutionally created water management agency in Wyoming composed of the four Water Division Superintendents and the State Engineer.

8. "Superintendent" is the member of the Board who is the water administration official for the Water Division where the interstate ditch is located. (The two Water Divisions in the Yellowstone River drainage are Water Division Numbers Two and Three.)

9. "Date of Priority" shall mean the earliest date of actual beneficial use of water, unless evidence and circumstances pertaining to a particular claim establish an earlier date.

10. "Point of Diversion" is defined to be the legal land description by legal subdivision, section, township, and range of the location of the diversion structure for an interstate ditch from a natural stream channel.

11. "Place of Use" is defined to be the legal land description (legal subdivision, section, township, and range) of the lands irrigated by an interstate ditch.

12. "Person" is defined as an individual, a partnership, a corporation, a municipality or any other legal entity, public or private.

13. "Claimant" is defined as any person claiming the use of water from an interstate ditch as herein defined.

Article IV. Procedures

The procedures for determining and adjudicating water rights associated with interstate ditches shall be categorized as follows: (A) Where the point of diversion is in Wyoming and place of use in Montana, and (B) Where the point of diversion is in Montana and place of use in Wyoming.

A. Wyoming Procedure

1. The Yellowstone River Compact Commission will provide a claim form to be completed by the claimant that will describe the location and point of diversion and land being irrigated, the priority date claimed, method of irrigation and such other information required to describe the claim. (A sample form for this purpose is attached.)

2. The Yellowstone River Compact Commission will send the claim form to water users on the interstate ditches.

3. Water users will complete the claim form and file it with the Yellowstone Compact Commission, which, when found to be correct and complete, will be forwarded to the Board for verification.

4. Upon receipt of the form, the Board shall forward it to the appropriate Superintendent, who, in cooperation with the Department, will validate the information including the use that has been made of the water, the number of acres and location of lands being irrigated, the priority date, and all other relevant information. The Superintendent and the Department will utilize aerial photography and other information to have prepared a reproducible map showing the location of the ditch system, lands irrigated, point of diversion, etc., of the claim.

5. After the validation procedure, the Superintendent will hold a hearing, after appropriate notice and advertisement, at which time the claimant shall describe, in detail, the use that has been made of the water and the lands that are being irrigated, establish a priority date, etc. Costs incurred in advertising shall be paid by the claimant. If a single hearing is held to consider several claims, the costs of advertising shall be shared equally among the claimants. Anyone who opposes the claim shall appear and state the reasons, if any, for opposition to the claim. If there is no opposition to the claim, cost incurred in holding the hearing shall be paid by the claimant. If protestants do appear and oppose the claim, hearing costs will be paid 50 percent by the claimant and 50 percent by the protestant, or if there is more than one protestant, the remaining 50 percent shall be shared equally among the protestants.

6. At the conclusion of the hearing, the Superintendent shall forward the record to the Yellowstone River Compact Commission with his findings and recommendations. The Yellowstone River Compact Commission will make the

determination of the amount of the right, the location, and the priority date, and then send the record to the Board.

7. The Board shall review the record and integrate it into its water rights system. Upon entry of the record by the Board, the information shall be forwarded to the Department and the Chairman of the Yellowstone River Compact Commission.

8. Upon the entry of the right into the Board's records, it will have the following attributes:

   a. The right will be a Wyoming water right with a priority date as established by this procedure.

   b. The amount of the right will be determined as provided by Wyoming law.

B. Montana Procedure

1. The Yellowstone River Compact Commission will provide a claim form to be completed by the claimant that will describe the location and point of diversion and land being irrigated, the priority date claimed, method of irrigation and such other information required to describe the claim.

2. The Commission will send the claim form to water users on the interstate ditches.

3. Water users will complete the claim form and file it with the Yellowstone River Compact Commission, which, when found to be correct and complete, will be forwarded to the Department for verification.

4. Upon receipt of the form, the Department, in cooperation with the Wyoming State Engineer's Office, will validate the information, including the use that has been made of the water, the number of acres and location of lands being irrigated, the priority date, and all other relevant information. The appropriate Superintendent and the Department will utilize aerial photographs and other information to have prepared a reproducible map showing the location of the ditch system, land irrigated, point of diversion, etc., of the claim.

5. The Department will then forward the record to the Yellowstone River Compact Commission with its findings and recommendations. Upon approval by the Commission, the record shall be submitted to the Montana Water Court for adjudication. A duplicate record will be forwarded to the Wyoming State Engineer's Office, the Board, and the Chairman of the Yellowstone River Compact Commission upon adjudication.

6. Upon adjudication of the right by the Montana Water Court, it will have the following attributes:

   a) The right will be a Montana water right with a priority date as established by this procedure.

   b) The amount of the right will be determined as provided by Montana law.

Article V. Exclusions

A. These rules recognize the limitation in Article VI of the Yellowstone River Compact regarding Indian water rights.

B. These rules shall not be construed to determine or interpret the rights of the States of Wyoming and Montana to the waters of the Little Bighorn River.

Article VI. Claim Form Submission Period

All claims must be submitted to the Yellowstone River Compact Commission, c/o District Chief, United States Geological Survey, 821 E. Interstate, Bismarck, ND 58501, within 90 calendar days after the claimant has received the claim form from the Commission. The blank claim form will be sent certified mail to the water user and the submission period of 90 calendar days will begin with the next day following receipt of the form, as evidenced by the certified mail receipt card. For good cause shown in writing, an extension of time beyond the 90 days for submittal may be obtained from the Commission.

YELLOWSTONE RIVER COMPACT COMMISSION

WYOMING

GORDON W. FASSETT
STATE ENGINEER
HERSCHLER BUILDING
4TH FLOOR EAST
CHEYENNE, WYOMING 82002
(307) 777-7354

UNITED STATES

WILLIAM F. HORAK
CHAIRMAN
U.S. GEOLOGICAL SURVEY
821 E. INTERSTATE AVENUE
BISMARCK, NORTH DAKOTA 58501
(701) 250-4601

MONTANA

GARY FRITZ
ADMINISTRATOR, WATER RESOURCES DIVISION
DEPT. OF NATURAL RESOURCES & CONSERVATION
1520 EAST SIXTH AVENUE
HELENA, MONTANA 59620
(406) 444-6603

YELLOWSTONE RIVER COMPACT COMMISSION

CLAIM FORM FOR INTERSTATE DITCHES

1. Name of ditch or canal: _____

2. Source of water supply: _____

   Tributary of _____

3. Name of claimant: _____

   Address _____

   City _____ State _____Zip Code _____

   Home Phone No. _____ Business Phone No. _____

4. Person completing form: _____

   Address _____

   City _____ State _____Zip Code _____

   Home Phone No. _____ Business Phone No. _____

5. Method of irrigation: _____

6. Point of diversion: County _____ State _____

   Headgate located in the ___¼ ___¼, Section ____, T.___R.____

   (a) Description of headgate: (Briefly describe the materials and general features, date constructed or last known work, general condition.) _____

   _____

   _____

(b) Describe water measuring device: _____

_____

_____

(c) If the point of diversion is in Montana:

1. What flow rate has been claimed?

_____ ☐ cubic feet per second

☐ gallons per minute

☐ miner's inches

2. What volume of water has been claimed?

_____ acre-feet

7. Dimensions of ditch at headgate: Width at top (at waterline) _____ feet; width at bottom _____ feet; side slopes (vertical:horizontal) _____:_____; depth of water _____ feet; grade _____ feet per mile.

8. Place of use and acres irrigated: County_____ State ____ Give legal subdivisions of land owned by you on which water is being used (acres claimed): An example field is shown in the first line.

T.	R.	SEC.	NE¼				NW¼				SW¼				SE¼				TOTAL
			NE¼	NW¼	SW¼	SE¼	NE¼	MW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
58N	95W	18			25.1											10.2			35.3

9. Describe any additional uses of water claimed from the ditch: _____

10. Date of first beneficial use of water (priority date) on lands described above for _____ Ditch is_____ (mo/day/yr) and shall be the same for all lands claimed on this form.

11. Has irrigation water been diverted onto all lands shown in the above tabulation each year since completion of works?__ If not, state exceptions and reasons therefore: _____

_____

_____

12. Attach documentary evidence or affidavits showing your ownership or control of the above lands, as well as the historic use of water on these lands. _____

_____

_____

13. What permit or claim numbers have been assigned to known records filed with either the Wyoming State Engineer's Office or the Montana Department (DNRC) for irrigating the above lands? _____

_____

_____

14. Have personnel in the Wyoming State Engineer's Office or the Montana Department (DNRC) been contacted to obtain the information given in No. 13? ( ) Yes ( ) No

15. Describe any flumes or pipelines in the ditch conveyance system:_____

_____

_____

16. Describe ordinary annual period of use: _____ to _____
(mo/day) (mo/day)

_____.

17. Attach copies of aerial photographs, U. S. Geological Survey maps or other such documents showing the ditch and lands irrigated that give evidence to this claim and may be useful to the Commission.

* * * * * * * * * *

State of _____)
) SS
State of _____)

I, _____, having been duly sworn, depose and say that I, being of legal age and being the claimant of this claim for a water right, and the person whose name is signed to it as the claimant, know the contents of this claim and the matters and things stated there are correct.

_____

_____

Subscribed and sworn before me, this ____day of _____, 19__.

_____
Notary Public

Residing at: _____

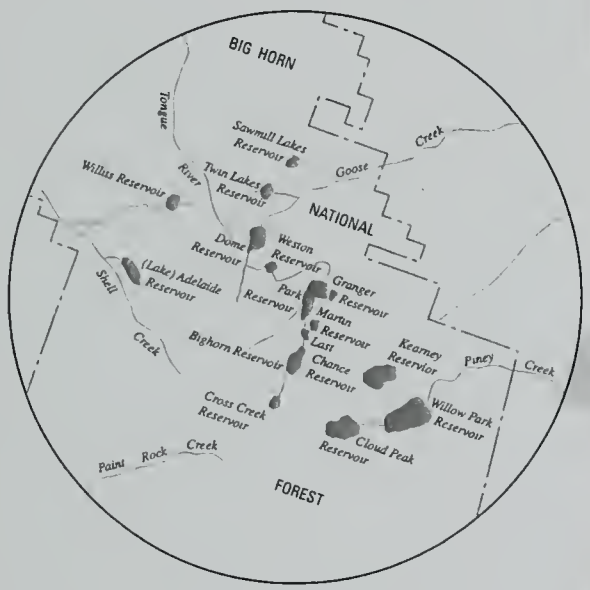
My commission expires: _____

CONVERSION TABLE

Multiply inch-pound units	By	To obtain SI units
	Length	
feet (ft)	0.3048	meters (m)
miles (mi)	1.609	kilometers (km)
	Area	
acres	4,047	square meters (m^2)
	0.4047	*hectares (ha)
	0.4047	square hectometer (hm^2)
	0.004047	square kilometers (km^2)
square miles (mi^2)	2.590	square kilometers (km^2)
	Volume	
cfs-day or second-foot day (ft^3/s-day)	2,447	cubic meters (m^3)
	0.002447	cubic hectometers (hm^3)
cubic feet	0.02832	cubic meters
acre-feet (acre-ft)	1,233	cubic meters (m^3)
	0.001233	cubic hectometers (hm^3)
	0.000001233	cubic kilometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	28.32	liters per second (L/s)
	28.32	cubic decimeters per second (dm^3/s)
	0.02832	cubic meters per second (m^3/s)
acre-feet per year (acre-ft/yr)	1,233	cubic meters per year (m^3/yr)
	0.001233	cubic hectometers per year (hm^3/yr)
	0.000001233	cubic kilometers per year (km^3/yr)

*The unit hectare is approved for use with the International System (SI) for a limited time. See National Bureau of Standards Special Bulletin 330, p. 12, 1977 edition.

LOCATION MAP



YELLOWSTONE RIVER COMPACT COMMISSION

YELLOWSTONE RIVER BASIN

EXPLANATION

▲ COMPACT STREAMFLOW-GAGING STATION

◧ COMPACT RESERVOIR-CONTENT STATION

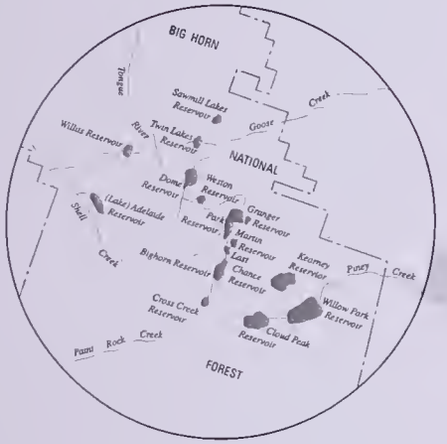
06260300 STATION NUMBER

0 10 20 30 40 MILES

0 10 20 30 40 KILOMETERS

MA

LOCATION MAP



YELLOWSTONE RIVER COMPACT COMMISSION

YELLOWSTONE RIVER BASIN

EXPLANATION

▲ COMPACT STREAMFLOW-GAGING STATION

◧ COMPACT RESERVOIR-CONTENT STATION

06260300 STATION NUMBER

0 10 20 30 40 MILES

0 10 20 30 40 KILOMETERS

MAP SHOWING LOCATIONS OF YELLOWSTONE RIVER COMPACT STREAMFLOW-GAGING AND RESERVOIR-CONTENT STATIONS

STATE DOCUMENTS COLLECTION

APR 26 2006

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